CAR & HiFi

INTERNATIONAL

3/25 · 4,80 €

European Edition

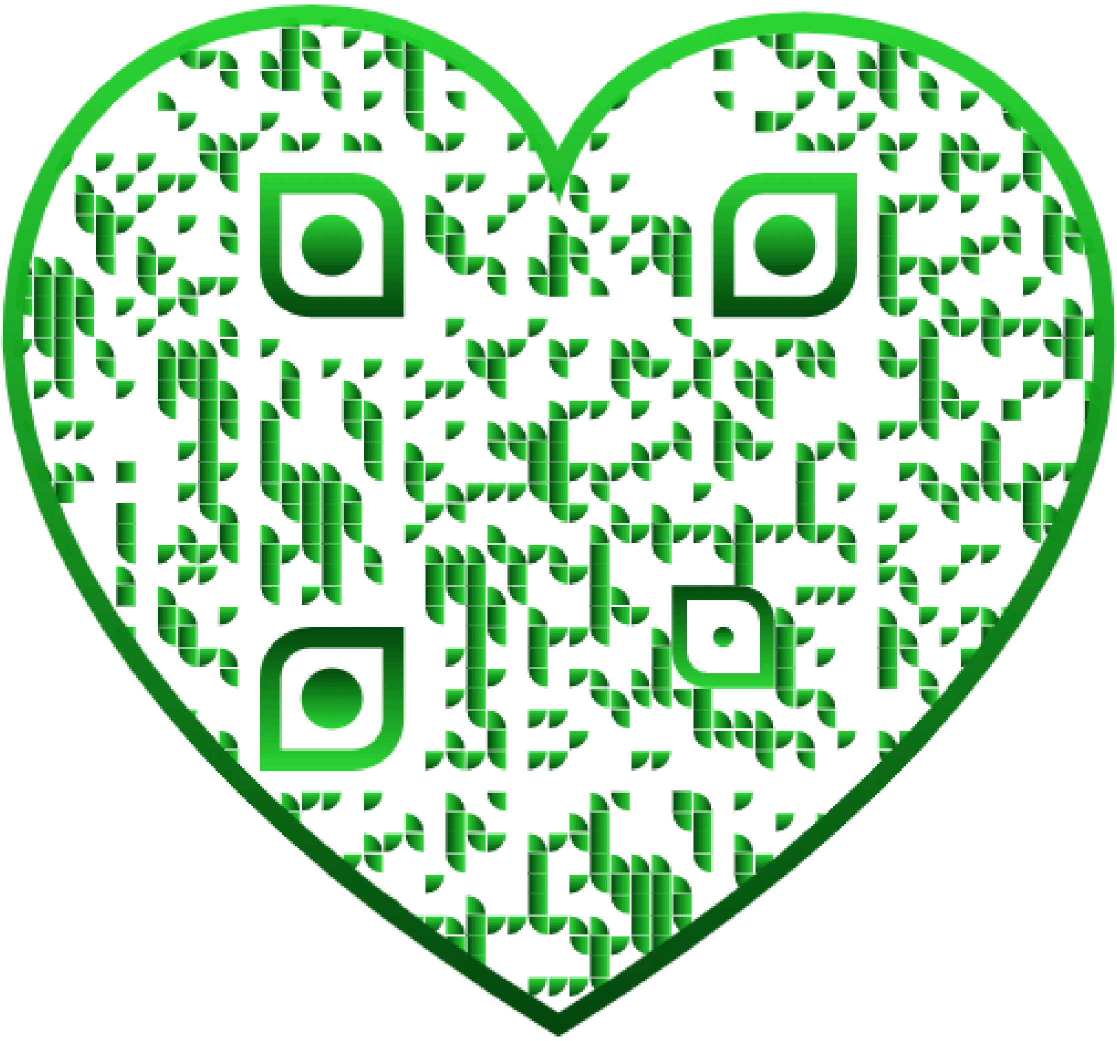
Best topics

- Ground Zero Anniversary Edition
- 2 DSP amplifiers in test
- Micro amp with Bluetooth receiver
- Class AB demonstration of excellence

Featured brands

- Audio System Germany
- ESX • Ground Zero
- Helix • Musway

GROUND ZERO
30th Anniversary Amplifier
GROUND ZERO
GROUND ZERO



MUSWAY

THE DSP EXPERTS

Also controllable via smartphone with the MUSWAY TUNEST app

6 amplifier channels plus 8 DSP channels

EISA AWARD Best Product 2025-2026
IN-CAR UPGRADE
Musway M6v4

2025 PRODUCT OF THE YEAR CAR&HiFi

BEST PRODUCT Spitzenklasse CAR&HiFi 1/2025

EMV-TIPP Ungestörter Radioempfang CAR&HiFi 1/2025

Musway M6v4 Spitzenklasse 1,1 CAR&HiFi 1/25 Preis/Leistung: hervorragend

M6v4 NEW

6-Channel Class D Amplifier with 8-CHannel DSP incl. ISO plug+play cable set
Now with the new Musway v4-DSP chipset with more power and better THD
6 x 80/130 Watts RMS @ 4/2 Ohms, 3 x 260 Watts RMS @ 4 Ohms bridged
6 x High Level Input 3-21 V/RMS with EPS®, 2 x AUX/RCA Input 1-5 V/RMS
1 x Optical Input/Stereo PCM 192 kHz / 24 bit
Compatible with the Musway Dongles BTA2, BTS-HD and BTS
Also available as M6v4-24V and M6v4-EVO
Dimensions: 150 x 45 x 200 mm

HEARABLE BETTER

THE NEW CLASS LEADER

DYNAMIC HEADROOM · ALL CHANNELS BRIDGEABLE · FULL RANGE DIGITAL · EPS® ERROR PROTECTION SYSTEM · HD AUDIO 96kHz · START STOP ready · AUTO TURN-ON · HIGH LEVEL INPUTS · SQ SOUND QUALITY · DSP DIGITAL SIGNAL PROCESSOR · ISO plug+play

WWW.MUSWAY.DE

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Tel. +49 7253 - 9465-0 · www.audiodesign.de

TECHNIK FÜR KLANGBEGEISTERTE

Highlights

Welcome to CAR&HIFI International 3/2025! I‘d like to take this opportunity to once again congratulate a long-time partner on their birthday. Ground Zero is celebrating its 30th anniversary this year. To mark the occasion, there‘s an Anniversary Edition featuring three products enhanced with very special goodies. You can read the test of three products in this issue. There are also two annual highlights in the form of DSP power amplifiers: the Musway with rock-solid amplifier technology and the highly innovative Helix. I hope you enjoy reading, and we‘ll see you in 2026!

Elmar Michels
Editor-in-chief

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GROUND ZERO®
GERMAN ENGINEERING

Ra
Radioactive

RADIOACTIVE

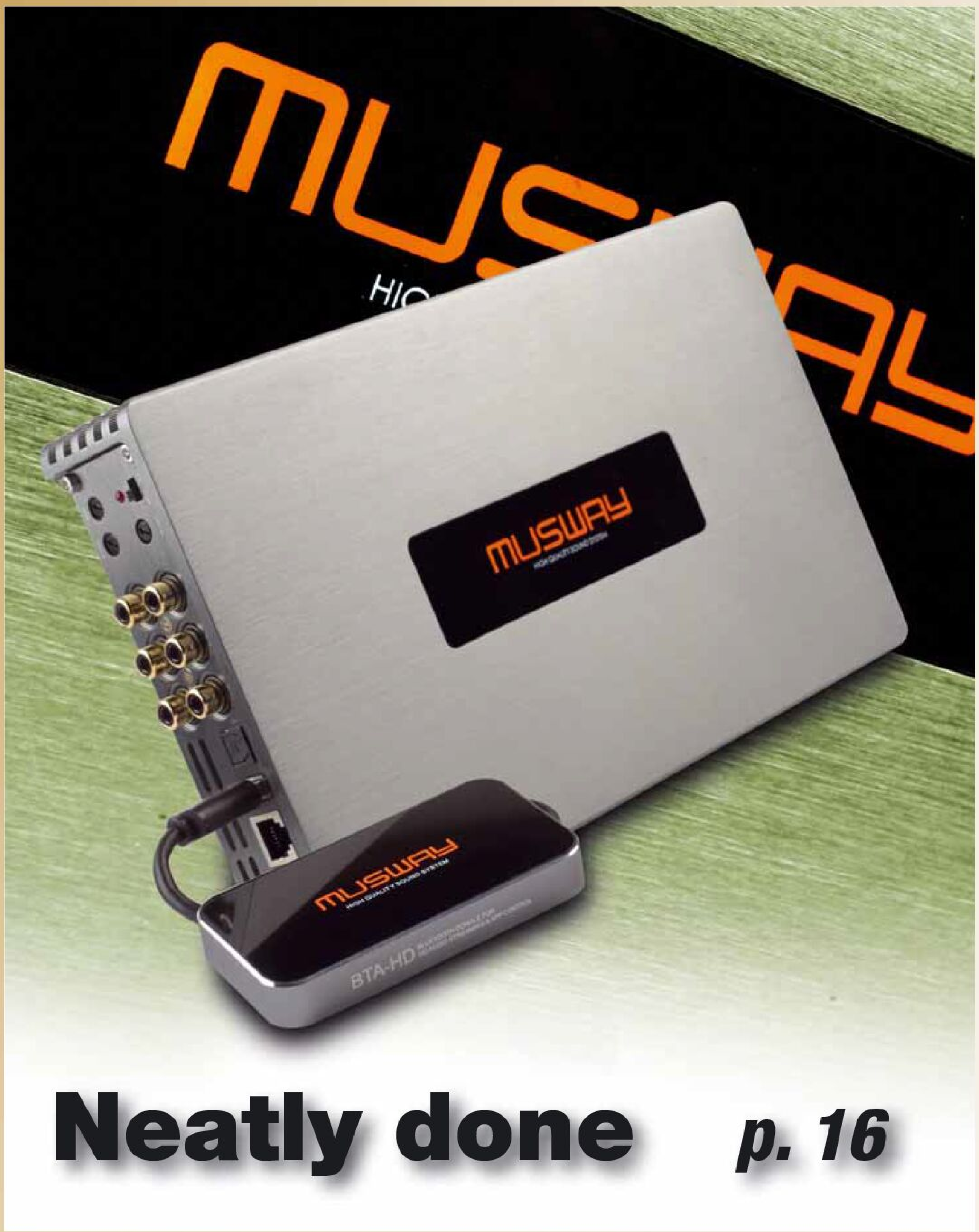
GZRB 20SPL-ACT

- Vented SPL subwoofer
- Airflow optimised ventilation
- High-power 8″ subwoofer
- Reinforced paper cone
- High-efficient class D amplifier module
- Stereo RCA input
- Stereo high-level input with auto-on function
- Variable bass boost function
- Remote-out
- Bass level remote control included
- Solid protective bars
- Output power: 280 Watts RMS / 330 Watts max
- Dimensions: 17.32 x 9.45 x 11.02″

www.ground-zero-audio.com

ESX
QUANTUM

Streaming Marvel p. 24


MUSWAY
BTA-HD

Neatly done p. 16

GROUND ZERO

Anniversary Edition p. 8

AUDIO SYSTEM
R-125.4

Tuned for Sound Quality *p. 30*

HELIX
V EIGHT DSP
ULTIMATE
MADE IN GERMANY

The next Generation *p. 36*

Tests

Anniversary Edition
Ground Zero GZA 125.4-30A + GZC 165-30A + GZW 12-30A
- Ground Zero Anniversary Edition 8

Neatly done
Musway M8
- 8-channel amplifier with a 12-channel DSP 16

Streaming Marvel
ESX QS-Four-BT-ISO
- Micro Four-channel Amplifier with Bluetooth 24

Tuned for Sound Quality
Audio System R-125.4
- Old-school analog power 30

The next generation
Helix V Eight DSP Ultimate
- 8-channel amplifier with 14-channel DSP 36

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Protect your woofer

With the new GZ GRILL 8U, 10U, and 12U, Ground Zero presents universal protective grilles for virtually all common subwoofer sizes. Each model consists of a two-piece set consisting of a mounting ring and protective grille and impresses with a particularly stable, low-resonance construction. Whether 8, 10, or 12 inches – the grilles fit perfectly with almost all Ground Zero subwoofers. The 12-inch version even covers chassis with an outer diameter of up to 315 mm. This ensures your subwoofers remain optimally protected – with a clean look, robust construction, and easy installation.

● **www.ground-zero-audio.com**

Next Generation

HELIX
V TWO
GERMAN CAR AUDIO

With the V TWO, Helix introduces the second amplifier in the new Next series, following the V Eight DSP Ultimate. These amplifiers are state-of-the-art and ‚Made in Germany'. They are ideally suited for electric vehicles and feature innovative signal transmission with the V-Link technology. The V TWO is the perfect complement to a multi-channel DSP power amplifier, providing up to 2 x 500 watts for demanding speakers and subwoofers.

● **www.audiotec-fischer.com**

Active Downfire for Sound Enthusiasts

MUSWAY
MF108A

Even in the heat of the 2025 summer, Musway developers are working hard on new technology for discerning music listeners. Because they also like to turn up the bass in a packed car, Musway is now launching a brand-new bass box duo with the 108A and 110A active downfire systems, which have everything they need to show off their muscle in just a few easy steps. The downfire concept – thanks to the powerful integrated digital Class D amplifier module – not only ensures that the 8- and 10-inch subwoofers deliver their musical best. This also perfectly protects them from everything else that needs to be brought into the car. When these bass wizards are given a chance to showcase their visual appeal, they delight their owners with their elegant appearance and manageable dimensions.

● **www.musway.de/english/**

VISION

HIGH-END DSP AMPLIFIERS

„It doesn't just stand there with its touch quality like a solid metal block, it is also convincing with finest components, incredible performance at 11 channels and last but not least with perfect features."

(Elmar Michels, Car & Hifi)

VISION
PC USB
OPTICAL INPUT
REMOTE
LOW LEVEL INPUT
HIGH LEVEL INPUT
SPEAKER OUTPUT
STATUS
POWER INPUT +12V GND
RESET

EISA AWARD Best Product 2024-2025
IN-CAR DSP AMPLIFIER
ESX VE1300.11SP

2024 PRODUCT OF THE YEAR CAR&HiFi

BEST PRODUCT Absolute Spitzenklasse CAR&HiFi 1/2024

ESX VE1300.11SP Absolute Spitzenklasse 1+ CAR&HiFi 1/24

EMV-TIPP Ungestörter Radioempfang CAR&HiFi 1/2024

Optional:

25
VOL
MODE
BASS

RC-DQ

Remote Controller with Display and large Knob

ESX TOOLKIT APP

App Store · Google Play

VE1300.11SP

11-Channel Class D Digital Amplifier with 12-Channel Sound Processor

9 x 100 Watts RMS @ 4/3 Ω + 2 x 200 Watts RMS @ 2 Ω, Dimensions: 226 x 43 x 120 mm
Analog Devices™ ADAU1452 Dual 2 x 32 Bit Processor, 294 MHz, Full HD Audio 96 kHz
AKM Velvet Sound™ Series 5 Signal Converter, A/D 32 Bit, D/A 32 Bit, Hi Level Inputs with EPS PRO @ 40 V/RMS
Integrated Bluetooth® Receiver for DSP Control via ESX TOOLKIT App and Full HD Audio Streaming

VE900.7SP

7-Channel Class D Digital Amplifier with 8-Channel Sound Processor

5 x 100 Watts RMS @ 4/3 Ω + 2 x 200 Watts RMS @ 2 Ω, Dimensions: 250 x 50 x 150 mm
Analog Devices™ ADAU1452 32 Bit Processor, 294 MHz, Full HD Audio 96 kHz
AKM Velvet Sound™ Series 5 Signal Converter, A/D 32 Bit, D/A 32 Bit, Hi Level Inputs with EPS PRO @ 40 V/RMS
Integrated Bluetooth® Receiver for DSP Control via ESX TOOLKIT App and Full HD Audio Streaming

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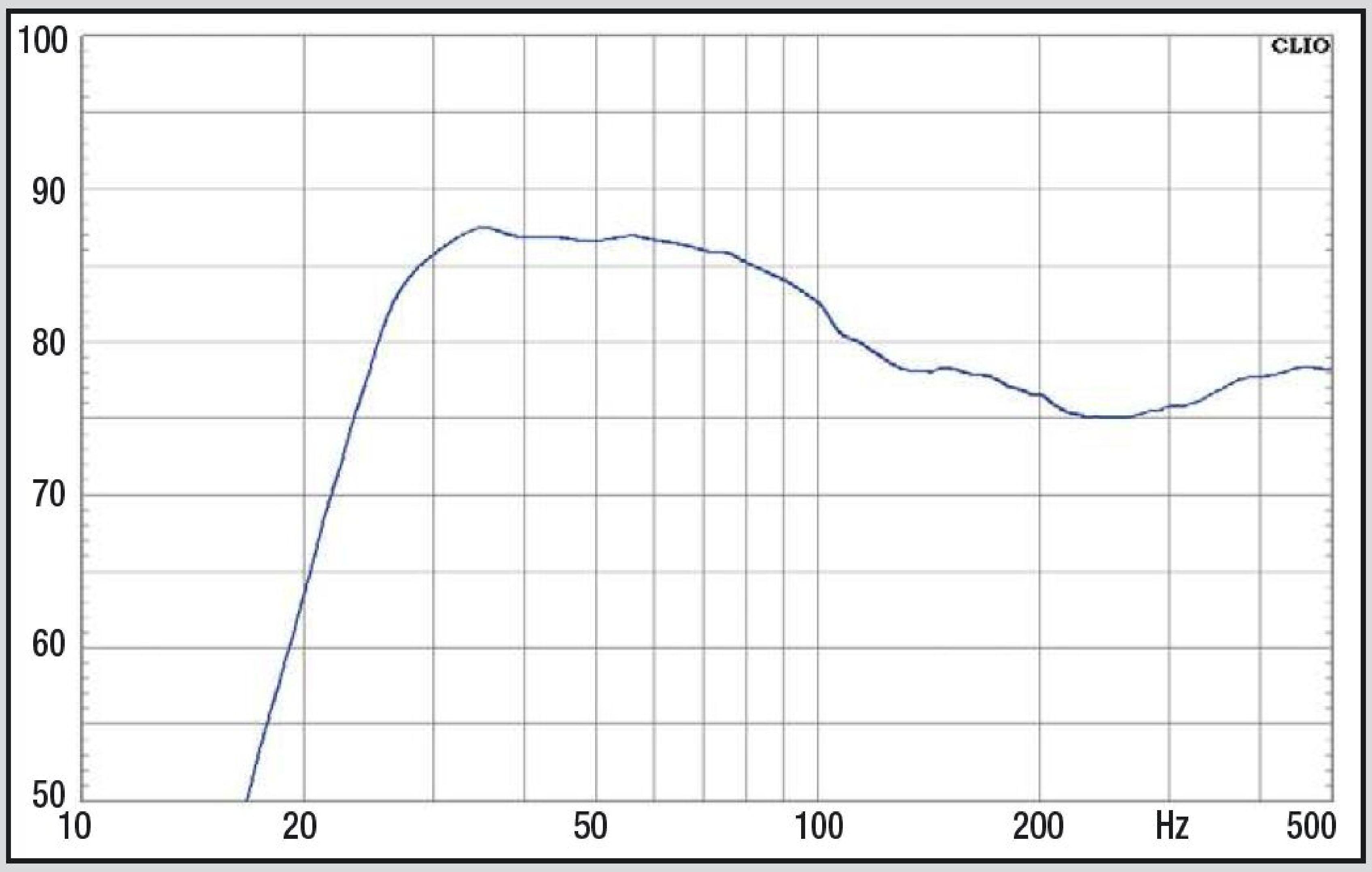
Ground Zero Anniversary Edition – Amplifiers, speakers, and subwoofers for your birthday

Anniversary Edition

Ground Zero is celebrating its 30th anniversary and is presenting a small, fine birthday edition of selected products to mark the occasion. We test the amp, the speaker system, and the subwoofer and explain what is special about them.

GROUND ZERO
30th Anniversary Amplifier
GROUND ZERO
GROUND ZERO
IN+
IN-
W+
W-
TW+
TW-

CAR&HIFI Laboratory



The GZW 12-30A feels right at home in the spacious vented box. It runs up to below 30 Hz at full SPL

First and foremost, we would like to take this opportunity to congratulate Felix Lautner, who founded the German company Ground Zero in Egmating near Munich in 1995. Over the years, it has become the worldwide owner of the Ground Zero brand, whose car audio products have earned an excellent international reputation.

Three ferrite rings lurk in the anniversary woofer, waiting to heat the fat three-inch coil

It‘s now 30 years on the clock, which is, of course, a reason to celebrate. Ground Zero is therefore launching a 30-year edition of a component system, a subwoofer and an amplifier, recognizable by the type designation “-30A”. Why is this being done? The -30A edition is intended as a small thank-you to long-time fans. The idea behind it is to offer fans and collectors a little added value with the anniversary edition. Speakers, subwoofers and amplifier each provide a special feature that is only available in the 30th anniversary edition. Of course, there is also a special look in the form of a black and gold finish as a distinguishing feature. Specifically, we have the GZA 125.4-30A amplifier, the GZC 165-30A speaker kit, and the GZW 12-30A subwoofer in the editorial office, which is the complete 30th anniversary edition. There will be no other versions or sizes. Of course, Ground Zero has chosen the three carefully; we have the most popular amplifier version with a four-channel amplifier, the most popular size with a 6.5“ two-way speaker, and also the public‘s favorite with a twelve-inch subwoofer. In terms of quality, the Anniversary series is decidedly higher-end, and Ground Zero is of course not aiming for cheap sales promotion at a dumping price. This is why the products are priced at EUR 400 to EUR 600 in the upper segment - but not yet in the high-end range, which is hardly affordable for fans. There is no series designation, such as GZRx for Radioactive or GZPx for Plutonium, for our anniversary series, as the specifications do not correspond to any series. With only GZA for Amplifier, GZC for Component, and GZW for Woofer, the -30A has unique names for all three. However, we can reveal that the level is roughly that of the Hydrogen series – of course, with the extras mentioned above, which we will now present in detail.

The subwoofer

At a hefty 16 kilos, the GZW 12-30A is a mighty chassis. It becomes immediately apparent that it is not intending to take any prisoners. Held together by an aluminum die-cast basket, the woofer is impressive even in the smallest details: The massive supply cables to the dual voice coil alone are impressive with 5-millimeter-wide tinsel leads - in double version! No wonder, because Ground Zero specifies a power handling capacity of 3000 watts, so everything has to be one size thicker than usual. The naturally solid cone, made of thick air-dried paper, is also the proverbial plank, and as an anniversary extra, it has a black dust cap made of highly

GROUND ZERO
GERMAN ENGINEERING
GZW 12-30A
3500 W 2 x 2 Ohm
30th Anniversary

In addition to an extra-large motor, the woofer shines with a rock-hard paper cone

stable carbon fiber. The surround is narrow, but at 3 centimeters high, it allows for enormous excursion. New and as a special anniversary goodie, Ground Zero has added a potent motor, where the -30A differs significantly from the original Hydrogen model. With a one-centimeter-thick, finely machined top plate and three two-centimeter-thick ferrite rings, we are looking at an insane amount of material. The voice coil also got an extra in the form of a little more copper. A voice coil measuring 3 inches or 76 millimeters was given more wire on the winding, so that the load capacity was also increased accordingly.

The speaker set

Our GZC 165-30A also impresses with plenty of motor in the woofer. The 6.5“ woofer is also equipped with a huge and correspondingly resilient voice coil measuring 1.5 inches or 38 millimeters in diameter. Finely faced top plates and a thick ferrite ring are also present here. At first glance, the woofer looks quite similar to its Hydrogen colleague. Still, here too, the cone has been tweaked, and a new suspension has been calculated, recognizable by the red spider, which can be considered a small trademark of the newer Ground Zero developments. These are always carried out using powerful simulation software such as FineMotor or FineSuspension, and, as with the subwoofer, the Klippel measuring system is used afterwards to check the results. With the GZC

BEST PRODUCT
Top Class
CAR&HiFi INTERNATIONAL 3/25

Specifications	
Basket diameter	31,5 cm
Mounting diameter	28,4 cm
Mounting depth	19,8 cm
Magnet diameter	19,5 cm
Weight	16,2 kg
Nominal impedance	2 x 2 Ohm
DC resistance Rdc	3,46 Ohm
Voice coil inductance Le	3,81 mH
Voice coil diameter	76 mm
Membrane surface	523 cm^2
Resonant frequency fs	38 Hz
Mechanical quality Qms	8,08
Electrical quality Qes	0,51
Total quality Qts	0,48
Equivalent volume Vas	18,7 l
Moved mass Mms	361 g
Rms	10,61 kg/s
Cms	0,05 mm/N
B x l	24,08 Tm
Sound pressure 1 W, 1 m	87 dB
Recommended power	>1000 W
Test enclosure	BR 90 l
Port dimensions (d x l)	150 cm2 x 55 cm

Ground Zero GZW 12-30A	
Price	430 Euro
Contact	Ground Zero, Germany
Internet	www.ground-zero-audio.com

Rating		
◗ Sound	50 %	★★★★★
Low frequency extension	12,5 %	★★★★★
Sound pressure	12,5 %	★★★★★
Sound purity	12,5 %	★★★★★
Dynamics	12,5 %	★★★★★
◗ Lab	30 %	★★★★☆
Frequency response	10 %	★★★★★
Efficiency	10 %	★★⯨☆☆
Max. SPL	10 %	★★★★★
◗ Build quality	20 %	★★★★★

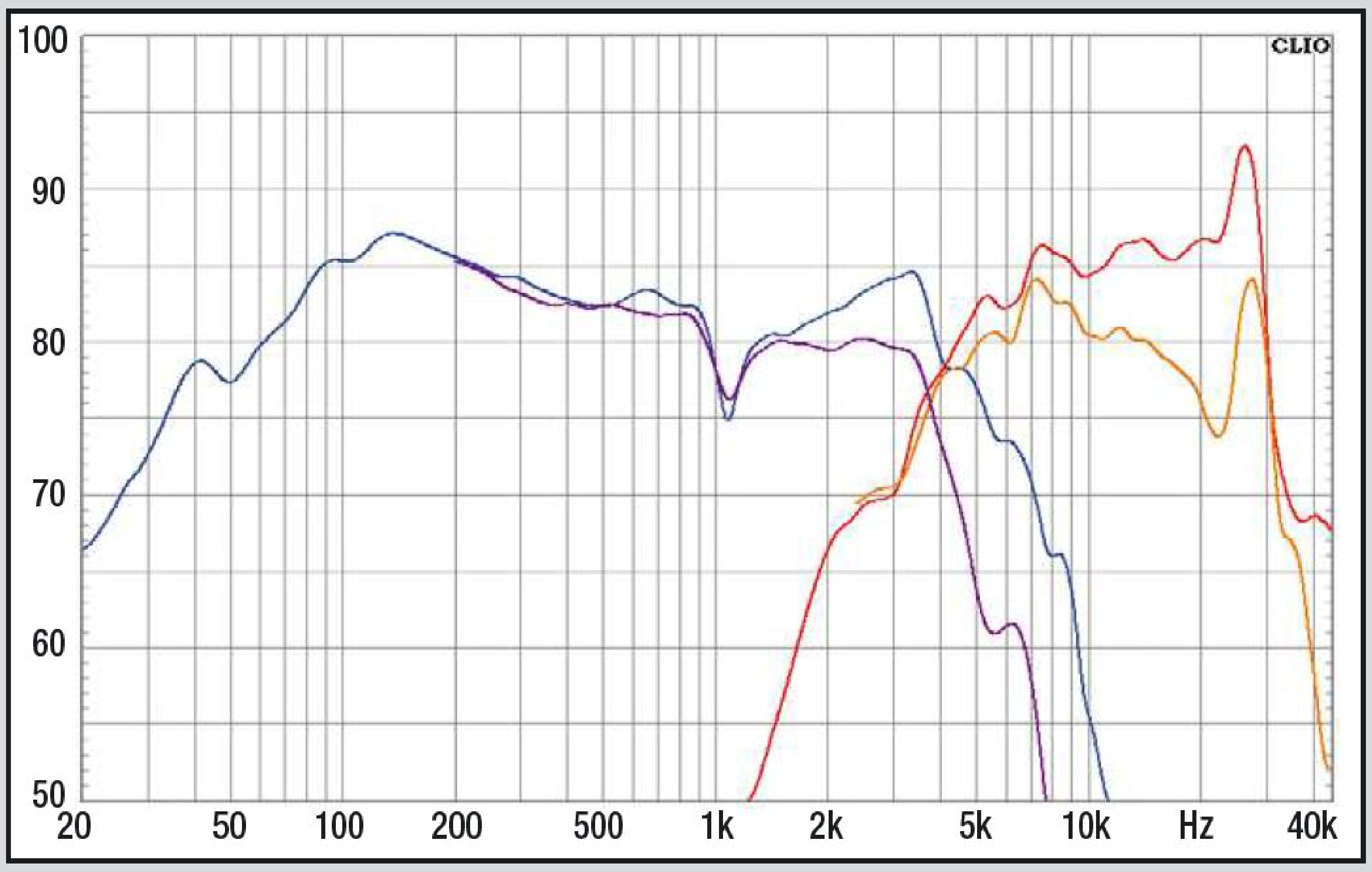
Top Class
★★★★⯨

CAR&HiFi INTERNATIONAL Germany 3/25

Price/performance: very good

„Very accomplished. The Anniversary Edition offers a whole lot of quality.“

CAR&HIFI Laboratory



The mid-bass driver of the GZC 165-30A shows a narrow-band dip at just over 1 kHz, which is not sound-wise critical. The tweeter runs up to 30 kHz with an unusual peak in the super high range

165-30A loudspeaker, however, the real Anniversary Extra comes with the tweeter, which in its basic features corresponds to the Nuclear tweeter, i.e., is borrowed from a higher product line than the woofer. We have an extra-large 28-millimeter silk dome tweeter in front of us, which, as is usual in this quality class, is equipped with a rear chamber. This lowers the resonance frequency and improves the usability at low frequencies. The crossover comes in a tried and tested manner, we find a classic layout with a 6 dB separation for the woofer and a 12 dB separation for the tweeter. Everything is fitted with very neat components, including the two jumpers. One of them controls the tweeter level, the second can attenuate the midrange of the midbass driver slightly, and the low-pass coil offers two taps to choose from.

The amplifier

Perhaps the finest of the three Anniversary products is the GZA 125.4-30A four-channel power amplifier. First of all, its exterior is a jewel with solid Build quality. The elegant heatsink looks breathtaking in black gold, and its proportions have been slightly adapted especially for the GZA 125.4-30A. No frills, only the elements required for operation are visible. But the real highlight lies before us after unscrewing the screws. Even at first glance, it‘s clear that this amplifier has to sound excellent. Of course, we‘ve already tested a few Ground Zero amplifiers that looked like this, but the basic beauty is obvious. By this, we don‘t even mean that the mainboard is equipped with really macroscopic through-hole components in the old-fashioned way, but rather that the circuit is largely symmetrical except for the power supply, and the exquisite components are in the right places. The power supply also has a special feature in that it supplies two internal voltages, one each for preamplification and amplification, so that load influences can be kept away from the sensitive preamplification when the amplifier is under load. In terms of components, we find high-quality Mundorf capacitors and power transistors, which are hidden under the circuit board in this layout. Ground Zero also installs a particularly low-noise operational amplifier, an OPA2134, behind the RCA inputs. Exactly one – for the gain.

The special anniversary extra of the GZA 125.4-30A is its reduction. By omitting any filters, hordes of operational amplifiers are saved in the signal path, and the number of transistors has also been deliberately reduced to a

GROUND ZERO
GERMAN ENGINEERING
GZC 165-30A
165 mm 180 W 4 Ohm
30th Anniversary

The distinguishing features of the -30A edition are the black and gold finish and the red spider

GROUND ZERO
GERMAN ENGINEERING

Neat components and jumpers in the crossover

minimum. As a reward for the Anniversary customer, this enables maximum signal fidelity, the best measurement values, and the finest sound. However, the typical Ground Zero bias control, which we also find on the GZA 125.4-30A in the form of two potentiometers, has been retained. This circuit allows the bias current to be increased, which further reduces the efficiency of the circuit, but offers „Class A-like“ behavior, to the delight of many a sound lover.

Measurements and sound

Let‘s stick with the GZA 125.4-30A, as it consistently delivers on its promises across the board. Rarely has an amplifier produced such low distortion (and residual noise); the measured distortion curves scratch the 0.001 % line, the GZA is below 0.002 % at all times. If you need even more zeros after the decimal point, you have to go for the Ground Zero Ultra – for several times the price of the GZA 125.4-30A, of course. The bias setting makes a clear difference with our GZA, with the High Bias setting proving to have less distortion at low power levels than the „normal“ Class AB setting. There is actually something that the GZA 125.4-30A cannot do, and that is power. Many amplifiers on the market offer significantly more watts, especially in the Absolute Top Class. But do not worry, all clear! It is enough. Because the GZA 125.4-30A sounds fantastic. It has a classic analog sound but can also pack a punch when required. It reaches deep down in the bass, and sudden dynamic jumps make you grin, because it‘s excellent fun how lively the amplifier can play. Transparency and clarity need not shy away from any comparison; it sounds as if the famous veil has been pulled from the speakers, allowing

Large 28 mm tweeter with coupled chamber

Specifications

Basket diameter	165 mm
Mounting diameter	145 mm
Mounting depth	70 mm
Magnet diameter	90 mm
Membrane tw	28 mm
Casing tw	48 mm
slope wf/tw	6/12 dB
Tweeter protection	–
Tweeter level adjustable	+2, 0 -2 dB
Grid	•
Others	–
Nominal impedance	4 Ohm
DC resistance Rdc	3,32 Ohm
Coil inductivity Le	0,18 mH
Coil diameter	38 mm
Membrane surface	127 cm^2
Resonance frequency fs	51 Hz
Mechanical Q-Factor Qms	2,77
Electrical Q-factor Qes	0,57
Overall Q-factor Qts	0,48
Equivalent volume Vas	13,5 l
Moved mass Mms	16,3 g
Rms	1,88 kg/s
Cms	0,60 mm/N
B x l	5,48 Tm
SPL 2 V, 1 m	86 dB
Recommended power	50 – 150 W

BEST PRODUCT
Top Class
CAR&HiFi
INTERNATIONAL 3/25

Ground Zero GZC 165-30A

Price	400 Euro
Contact	Ground Zero, Germany
Internet	www.ground-zero-audio.com

Rating

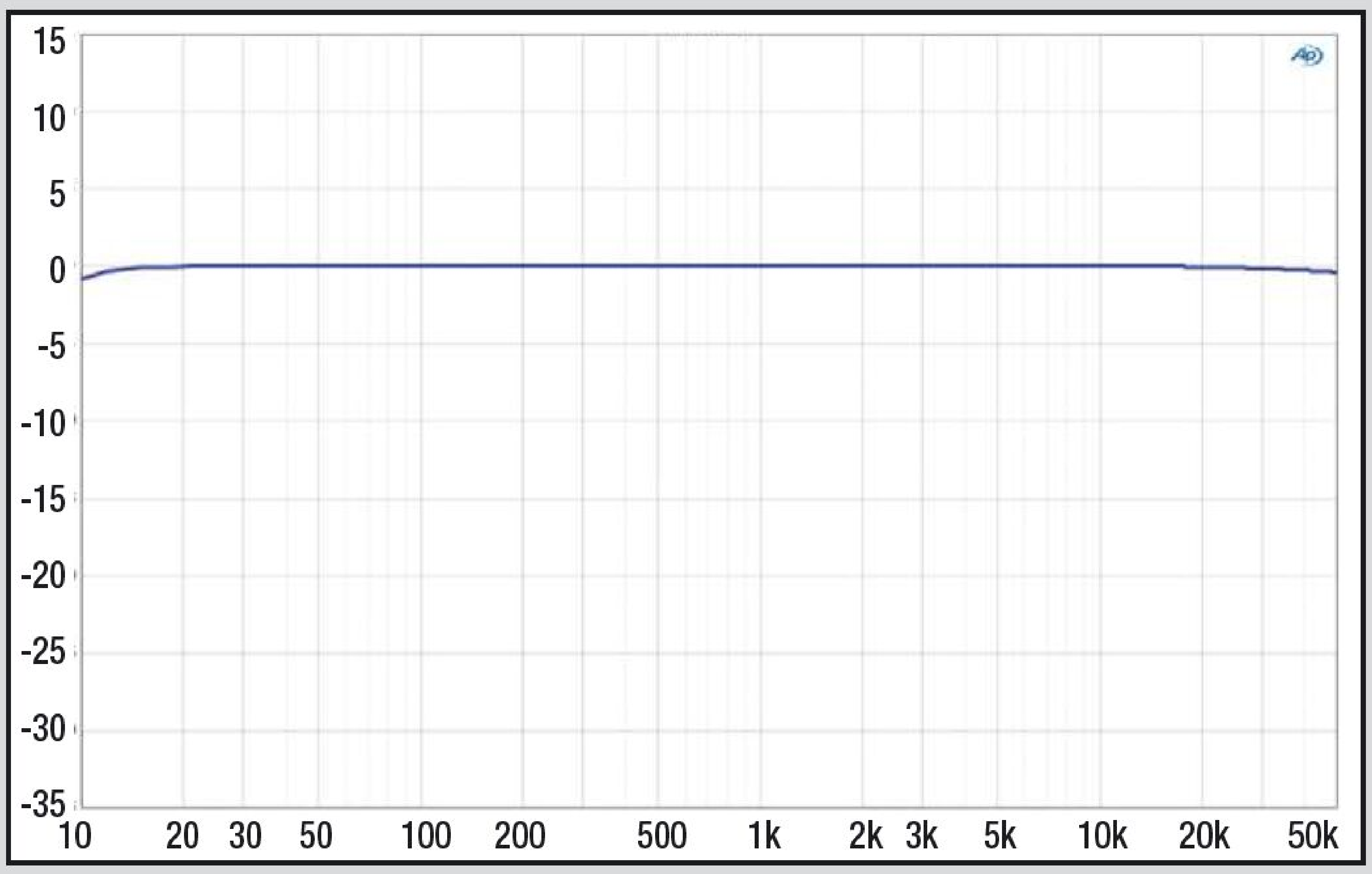
◗ Sound	55 %	★★★★★
Bass foundation	11 %	★★★★★
Neutrality	11 %	★★★★★
Sound stage	11 %	★★★★★
Spatiality	11 %	★★★★★
Dynamics	11 %	★★★★★
◗ Lab	30 %	★★★★☆
Frequency response	10 %	★★★½☆
Max. SPL	10 %	★★★★★
Distortion	10 %	★★★★★
◗ Practice	15 %	★★★★★
Crossover	10 %	★★★★★
Build quality	5 %	★★★★★

Top class
★★★★★
CAR&HiFi
INTERNATIONAL Germany 3/25

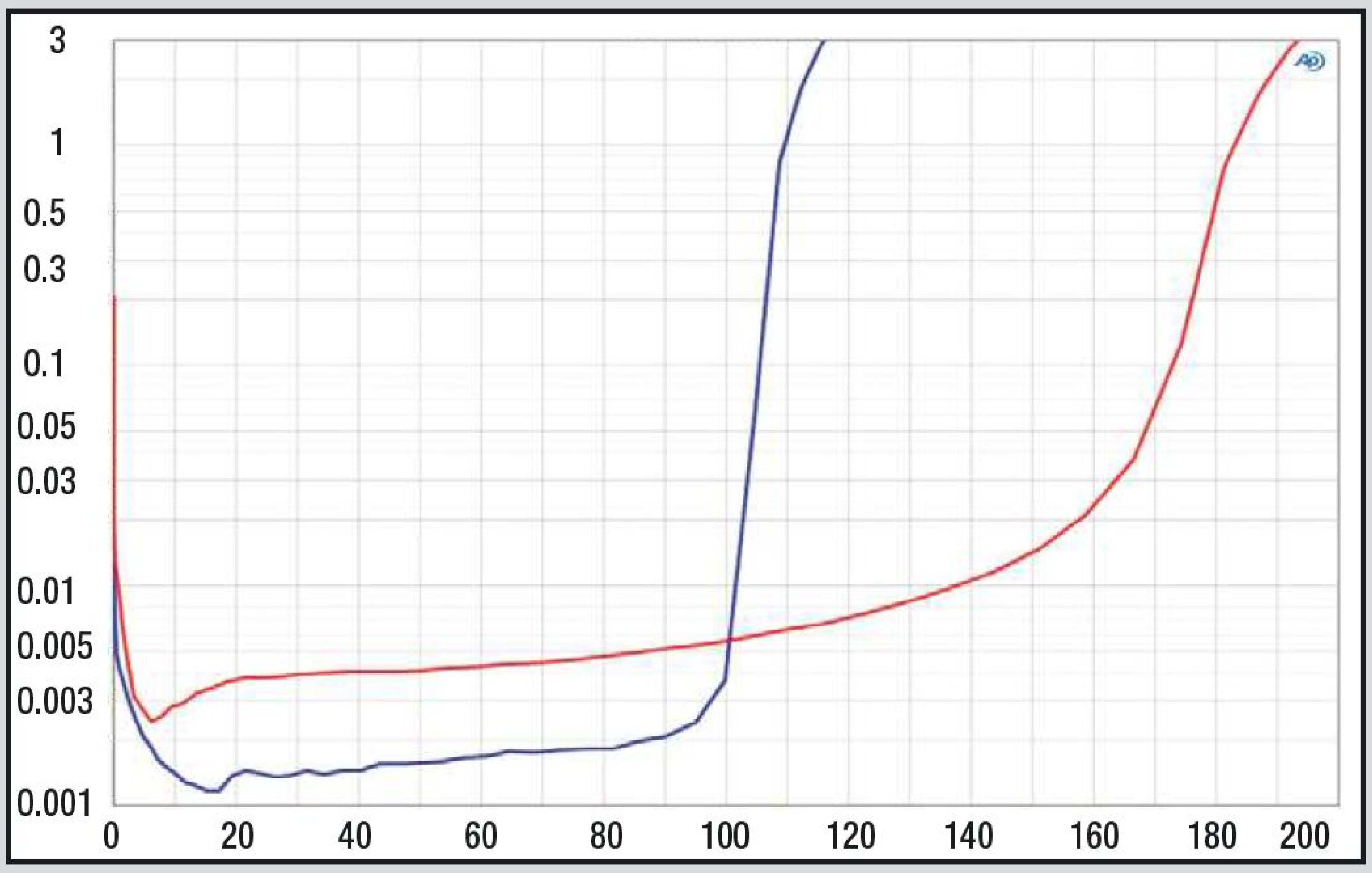
Price/performance: very good

„Very accomplished. The Anniversary Edition offers a whole lot of quality.“

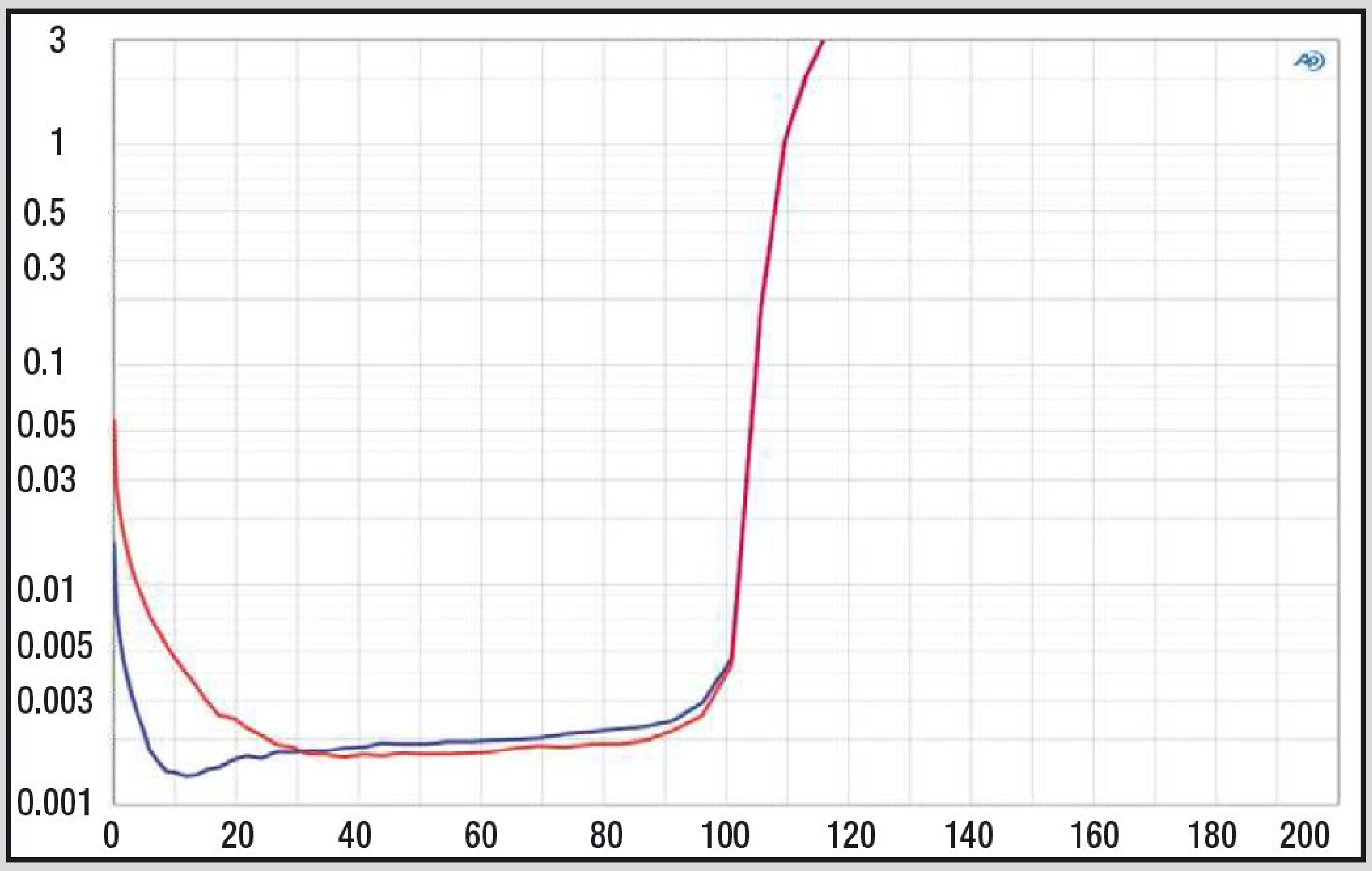
CAR&HIFI Laboratory



This is a straight line. The GZA 125.4-30A is far from finished at 50 kHz. As befits a high-end amp, it works very broadband



The THD+N curve is extremely low, especially at 4 ohms. 0.002 % is never reached before it stops at 110 watts. At 2 ohms, there are still 180 watts per channel

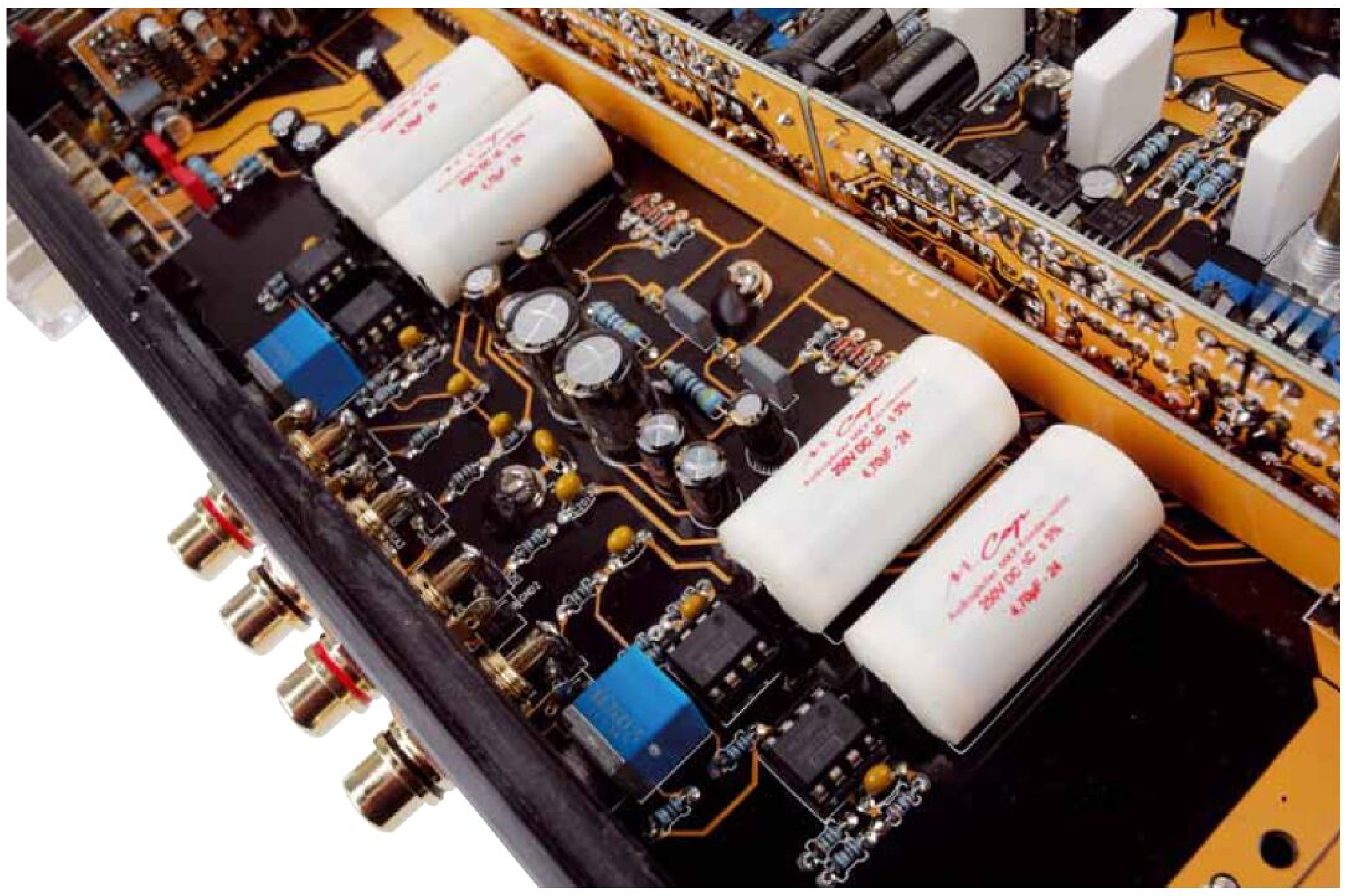


The comparison between maximum bias (blue) and minimum setting of the potentiometer shows less distortion with a lot of BIAS at low SPL. The differences disappear at medium and high loads

the music to breathe. As expected, the Ground Zero also spoils you with outstanding vocals and accurately reproduced instruments – a treat for sound lovers.

After this fantastic performance, it is a challenging task for the speakers to follow up. However, the GZC 165-30A does an excellent job, delivering dry, hard-hitting bass with great precision and decent depth right from the start. Anything deep, such as bass drums, male voices, or electric bass, is one of the system‘s specialties, especially when things get a little louder and more dynamic. So there‘s plenty of fun to be had, but the finest details, thanks to the excellent tweeter, can also inspire. The system sounds generously spacious and is also decidedly suitable for long distances, thanks to its pleasant reproduction. In terms of measurements, we are satisfied with the frequency response of the midbass driver, where only a narrow-band dip disturbs the otherwise perfect result. The large tweeter impresses with its broadband response, which is due to the coupled chamber at the bottom and the fact that the 28 mm dome is excellent at the top. Incidentally, the GZC 165-30A delivers sensationally good distortion measurements; the 6.5" produces almost no distortion, even at high SPLs.

The subwoofer, which you can almost tell is going to perform, is another safe bet. Our measurements confirm in advance that the GZW 12-30A has a balanced parameter set that is not characterized by extremes but leaves everything within limits. Our small-signal measurement does not do justice to the Boliden by any means, but it can be estimated that it can be used variably with a Q of 0.48, while any amount of moving mass demands performance. With a volume of 90 liters, our test cabinet makes no compromises – this woofer is not made to be hidden away; it wants to be seen and heard. Of course, it



Each channel has only one operational amplifier in the signal path, shown here directly behind the inputs

SPEAKERS
CH 1 CH 2
CH1/2 LEVEL
CH 1
CH 2
CH 3
CH 4
CH3/4 LEVEL
SPEAKERS
CH 3 CH 4
FUSES
POWER
BATT+ REMOTE GND
GZA 125.4-30A 30th ANNIVERSARY

GROUND ZERO
30th Anniversary Amplifier

The analog four-channel power amplifier has become a real gem

can also be accommodated in more compact enclosures or installed in a sealed box, but if you want the full potential, you need some space. But then the woofer rewards you with brute power right down to the low bass. It sounds like „the more, the merrier“ when the GZW 12-30A greedily sucks in the amplifier power and turns it into sound pressure. The pit of the stomach, the sternum, and the whole body react magnificently if need be. But even individual dry punches are accurately realized, although the GZW does not want to be a pure SQ woofer.

Conclusion

With the three Anniversary products, Ground Zero is presenting lovingly crafted special editions that collectors will want to buy immediately. For everyone else, these are beautifully made, high-performance hi-fi components that have a lot to offer. Congratulations!

Elmar Michels

Specifications

Channels	4
Power 4 ohms W	109
Power 2 ohms W	183
Power 1 ohms W	0
Bridged Power W	366
System Power W	648
Sensitivity max. mV	750
Sensitivity min. V	6,2
THD+N (<22 kHz) 5 W %	0,002
THD+N (<22 kHz) Half Power %	0,001
Signal-to-noise ratio dB(A)	98
Damping factor 20 Hz	483
Damping factor 80 Hz	492
Damping factor 400 Hz	486
Damping factor 1 kHz	484
Damping factor 8 kHz	421
Damping factor 16 kHz	326

Features

Low pass	–
High pass	–
Band pass	–
Bass boost	–
Subsonic filter	-
Phase shift	–
High-level inputs	–
Automatic switchon (Autosense)	–
RCA output	–
Start/stop capable	–
Dimensions (L x W x H in mm)	360 x 195 x 53
Others	BIAS control

SOUND AWARD

Absolute Top Class

CAR&HiFi INTERNATIONAL 3/25

Musway M6v4

Price	600 Euro
Contact	Ground Zero, Germany
Internet	www.ground-zero-audio.com

Rating

Sound	40 %	★★★★★
Bass	8 %	★★★★★
Neutrality	8 %	★★★★★
Transparency	8 %	★★★★★
Spatial imaging	8 %	★★★★★
Dynamics	8 %	★★★★★
Lab	35 %	★★★½☆
Power	20 %	★★½☆☆
Damping factor	5 %	★★★★★
Signal-to-noise ratio	5 %	★★★★★
Noise	5 %	★★★★★
Practice	25 %	★★★☆☆
Features	15 %	★★½☆☆
Build quality electronics	5 %	★★★★★
Build quality mechanics	5 %	★★★★★

Absolute Top Class

★★★★☆

CAR&HiFi INTERNATIONAL Germany 3/25

Price/performance: excellent

„Very accomplished. The Anniversary Edition offers a whole lot of quality.“

BEST PRODUCT
Absolute Top Class
CAR&HiFi INTERNATIONAL 3/25

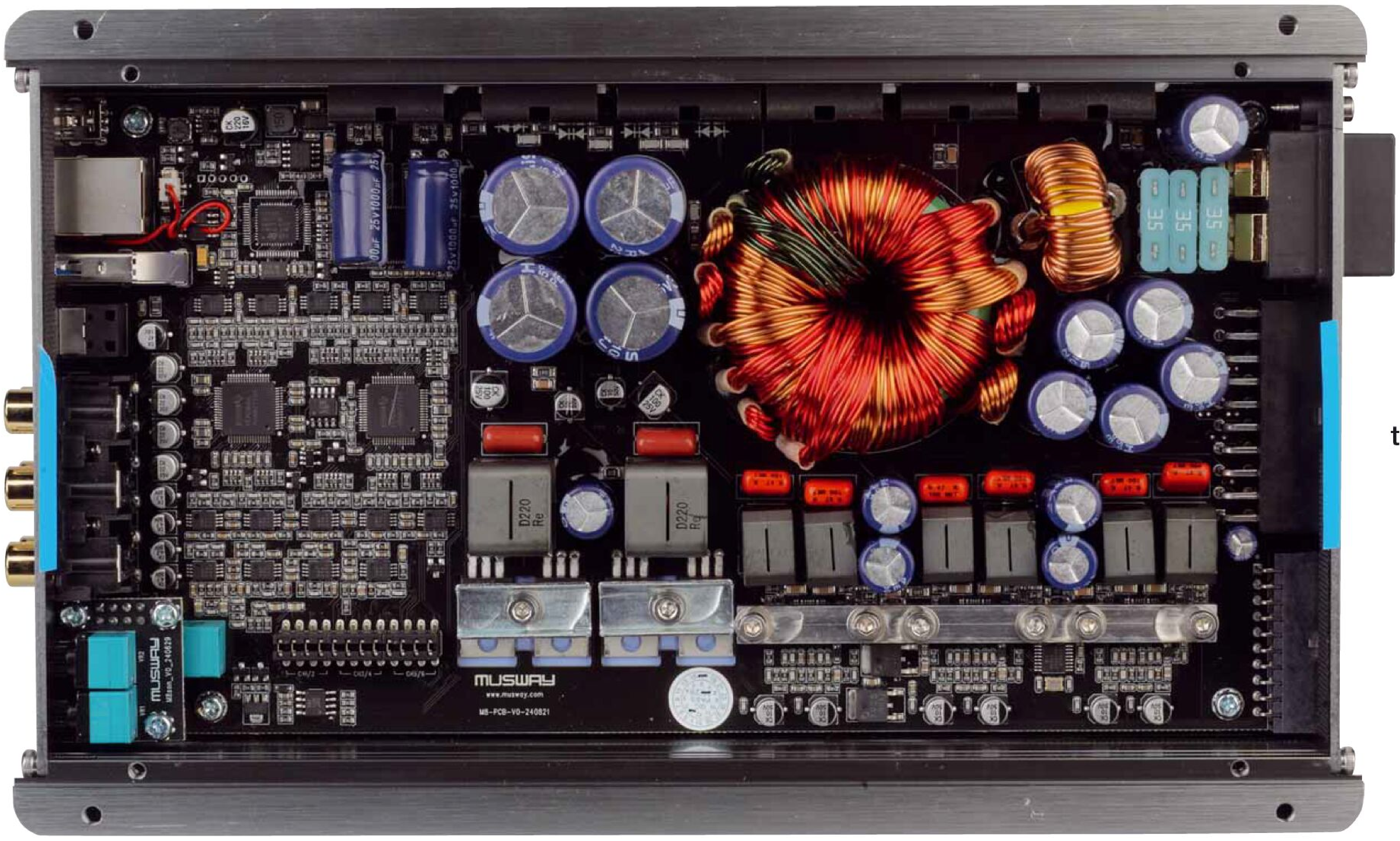
BEST EMC
Undisturbed FM reception
CAR&HiFi INTERNATIONAL 3/25

Musway M8 –
8-channel amplifier with a 12-channel DSP

Neatly done

Musway never tires of providing us with DSP amplifiers. Now we have a new model, the M8, which also offers improved accessories and software.

MUSWAY
HIGH
MUSWAY
HIGH QUALITY SOUND SYSTEM
MUSWAY
HIGH QUALITY SOUND SYSTEM
BTA-HD
BLUETOOTH DONGLE FOR
HD AUDIO STREAMING & APP CONTROL



The amplifier has two large channels with external MOSFETs and six smaller channels spread across three amplifier ICs

Musway's M series now features a wide range of DSP amplifiers. The original M6 model is now in its fourth generation and has been expanded with a 24-volt version and a PRO version. There are also the M4, M5, M10, and M12 models, categorized by the number of amplifier channels, so there should be something for everyone, right? Not exactly, because there is still a gap at eight channels, which Musway has previously filled with the D8 from another series. Now, we welcome the M8, an amplifier in typical Musway style, packed with connections fitting a DSP amplifier. Musway has invested heavily in the housing, completely encasing the M8 in aluminum – very sleek. On one side, you will find power connections and Molex connectors for inputs and speakers. Eight speaker-level inputs are sufficient for modern vehicles, but the eight outputs can be confu-

Specifications

Inputs
- 8-channel high-level with auto sense
- 1 x digital S/PDIF optical
- 1 x digital accessory
- 1 x AUX (RCA, stereo)
- Sensitivity 4 V (RCA), 19/30 V (high level)
- 2 x gain controls (high level)
- 1 x gain control (AUX)

Outputs
- 4-channel RCA (processed)
- Remote out

DSP channels
- 12

DSP software (V 1.0.3 in test)

Equalizer

Inputs
- Fully parametric EQ on outputs, 10 bands per channel
- EQ, shelf, 1st and 2nd order all-pass
- 20 – 20k Hz, 1 Hz steps
- +15 – 15 dB, Q 0.2 – 16

Outputs
- Fully parametric EQ on outputs, 31 bands per channel
- EQ, shelf, 1st and 2nd order all-pass
- 20 – 20k Hz, 1 Hz steps
- +15 – -15 dB, Q 0.2 – 16

Crossovers
- 20 – 20k Hz, Butterworth, Bessel, Linkwitz, 1 Hz steps
- Slope up to 48 dB/oct.

Time and SPL
- Sample rate 48 kHz, 7-mm steps (0.02 ms)

Outputs
- 0 – 708.3 cm (20.833 ms), 1024 samples
- Phase reversal 0, 180°
- Level adjustment outputs 0.1 dB steps, mute function

Features
- 6 presets
- Remote Out
- EPS (Error Protection System) for diagnostic function
- Automatic switchover to Bluetooth
- Adjustable switchover to high level for vehicle sounds
- Sub setup (bass channels for remote control)
- Power-save mode
- Settings can be exported and imported via WhatsApp

Optional accessories
- Bluetooth dongle BTS (audio streaming)
- Bluetooth dongle BTA-HD (audio streaming in HiRes quality and app control of all functionalities)
- Remote controller MyCon (volume, bass level, sources, setups, BT playback)
- RC1 remote controller (volume, bass level, sources, setups)
- RCA adapters MPK-RCA6, MPK-RCA6-PP for ISO
- Vehicle cable sets (Mercedes, BMW, Audi, etc.)

sing due to their placement on a 10-row connector. Musway designed this so that existing cable harnesses fit the plug-and-play connection. On the other side of the M8, there is the switch for automatic power-on (DC only) and three gain controls. The first is for speaker-level inputs

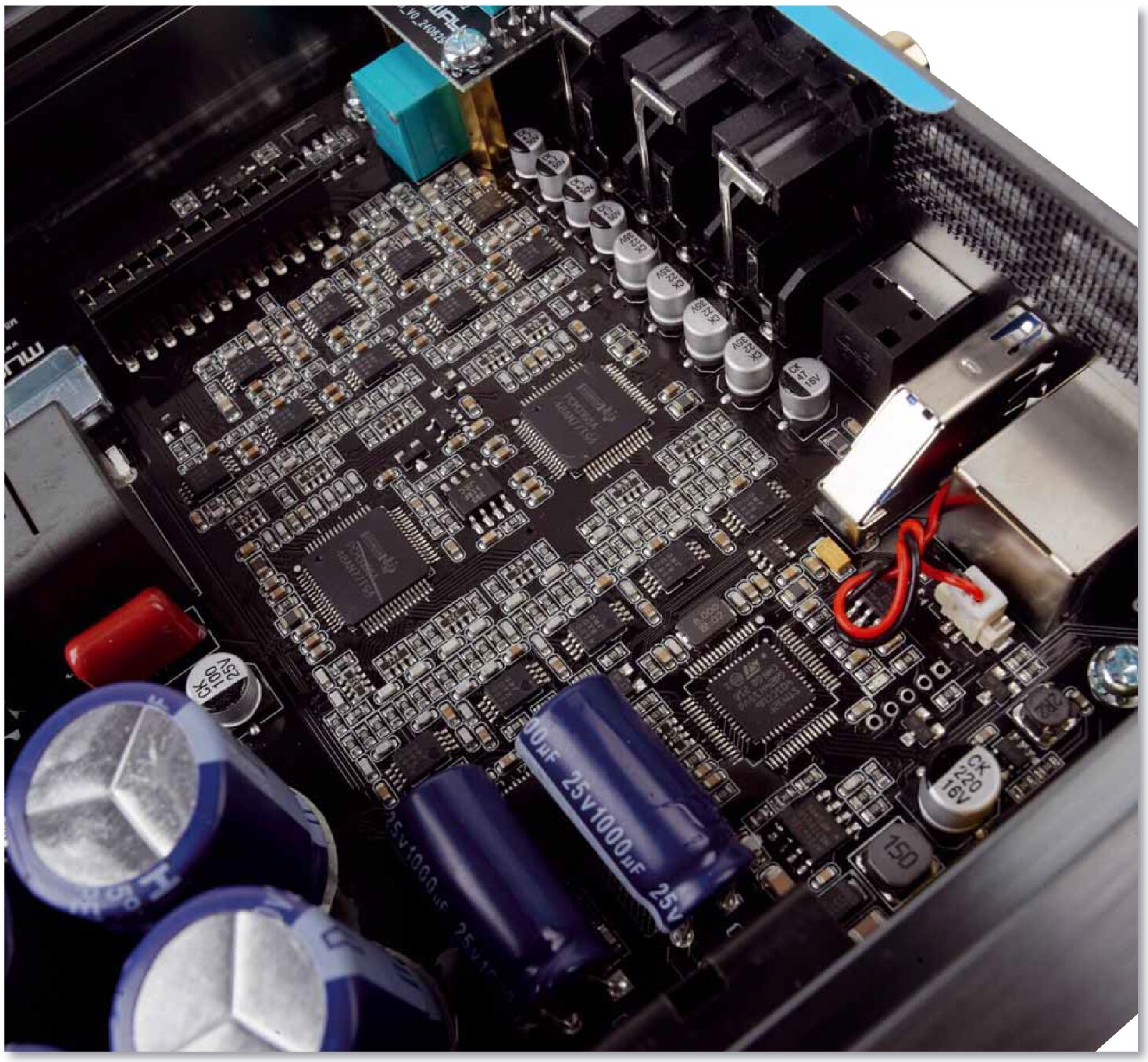
Software

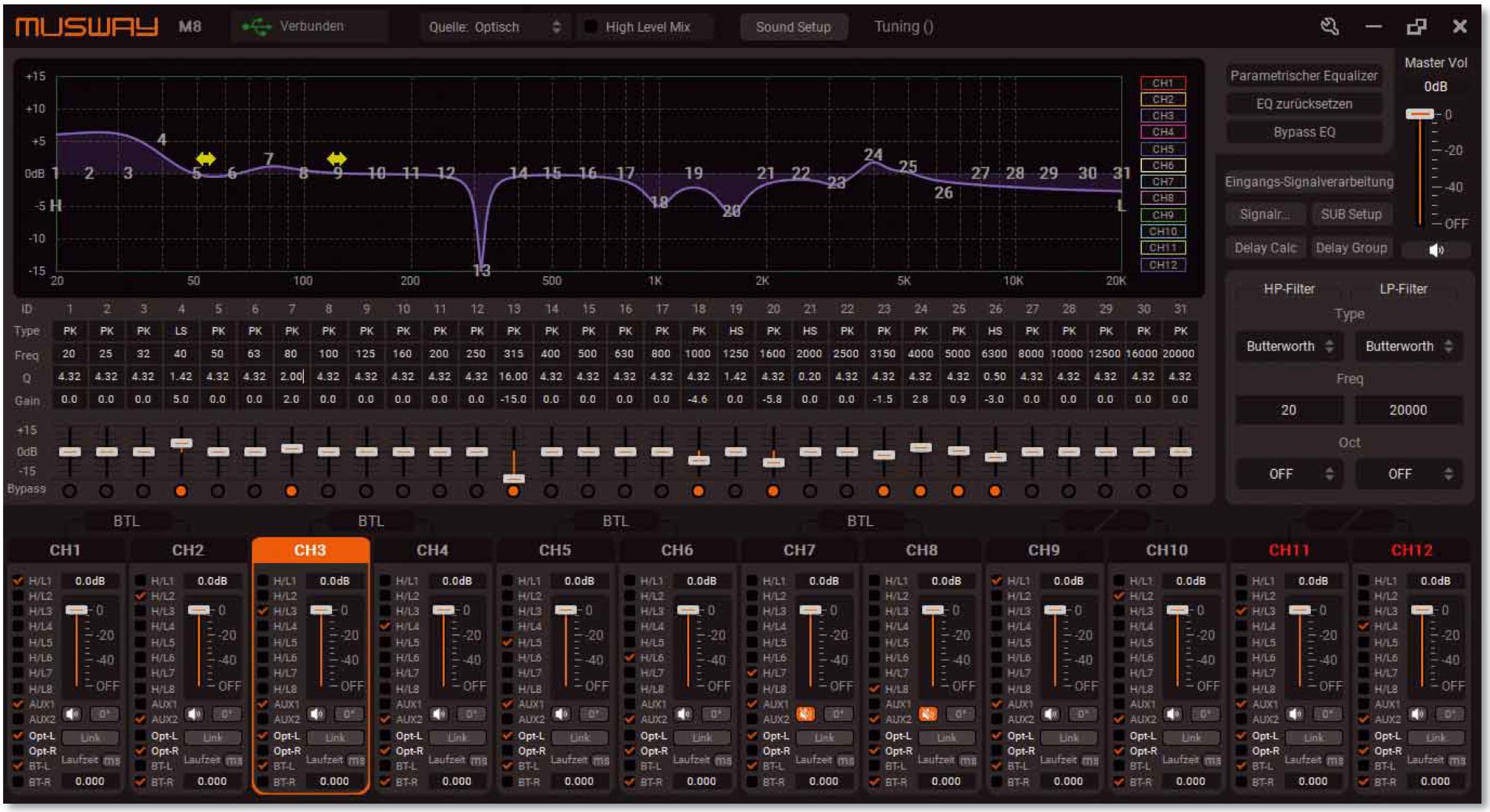
All Musway DSPs can be programmed either using PC desktop software or an Android app, with the latter working in conjunction with an optional Bluetooth module. Except for routing and a few features, all relevant settings are accessible in one window. When routing, it's important to note that selecting inputs in the routing matrix is not enough; you must also check the correct boxes in the main window. All channels feature bandpass filters up to 48 dB/octave across three characteristics. The EQ bands are fully parametric, and there is time alignment for outputs at 0.02 ms or 7 mm steps. It's very convenient that the time or distance is displayed accurately and plainly, without extraneous controls like coarse and fine adjustments. The frequency window clearly displays what's happening, and the EQs are easy to operate, even via keyboard. Channel grouping works well, a bridge connection can be shown, and up to four channels can be combined into a subwoofer group, which is then recognized by the optional remote control. Separate equalizers are available for the speaker-level inputs—10 per channel—matching the functionality of those for the outputs. The features are not numerous but are important: there is a power-saving shutdown for Can vehicles, a setting for switching through vehicle sounds, and an auto-mute feature to prevent crackling. Additionally, the input Molex supplies an input pin for reverse gear, which also feeds in vehicle sounds. Overall, Musway software is not the most comprehensive on the market, but it generally allows for smooth operation. A major advantage is the Musway "Tunest" app, which offers complete DSP programming and remote-control functions such as master and sub-level, as well as source selection.

MUSWAY
HIGH QUALITY SOUND SYSTEM
BTA-HD

The new BTA-HD Bluetooth dongle features hi-res streaming and DSP programming

The three large chips are the controller at the front and the converter codec at the back




MUSWAY M8
Verbunden
Quelle: Optisch
High Level Mix
Sound Setup
Tuning ()
Parametrischer Equalizer
EQ zurücksetzen
Bypass EQ
Eingangs-Signalverarbeitung
Signalr...
SUB Setup
Delay Calc
Delay Group
Master Vol
0dB
CH1
CH2
CH3
CH4
CH5
CH6
CH7
CH8
CH9
CH10
CH11
CH12
BTL
H/L1
H/L2
H/L3
H/L4
H/L5
H/L6
H/L7
H/L8
AUX1
AUX2
Opt-L
Opt-R
BT-L
BT-R
Link
Laufzeit
ms

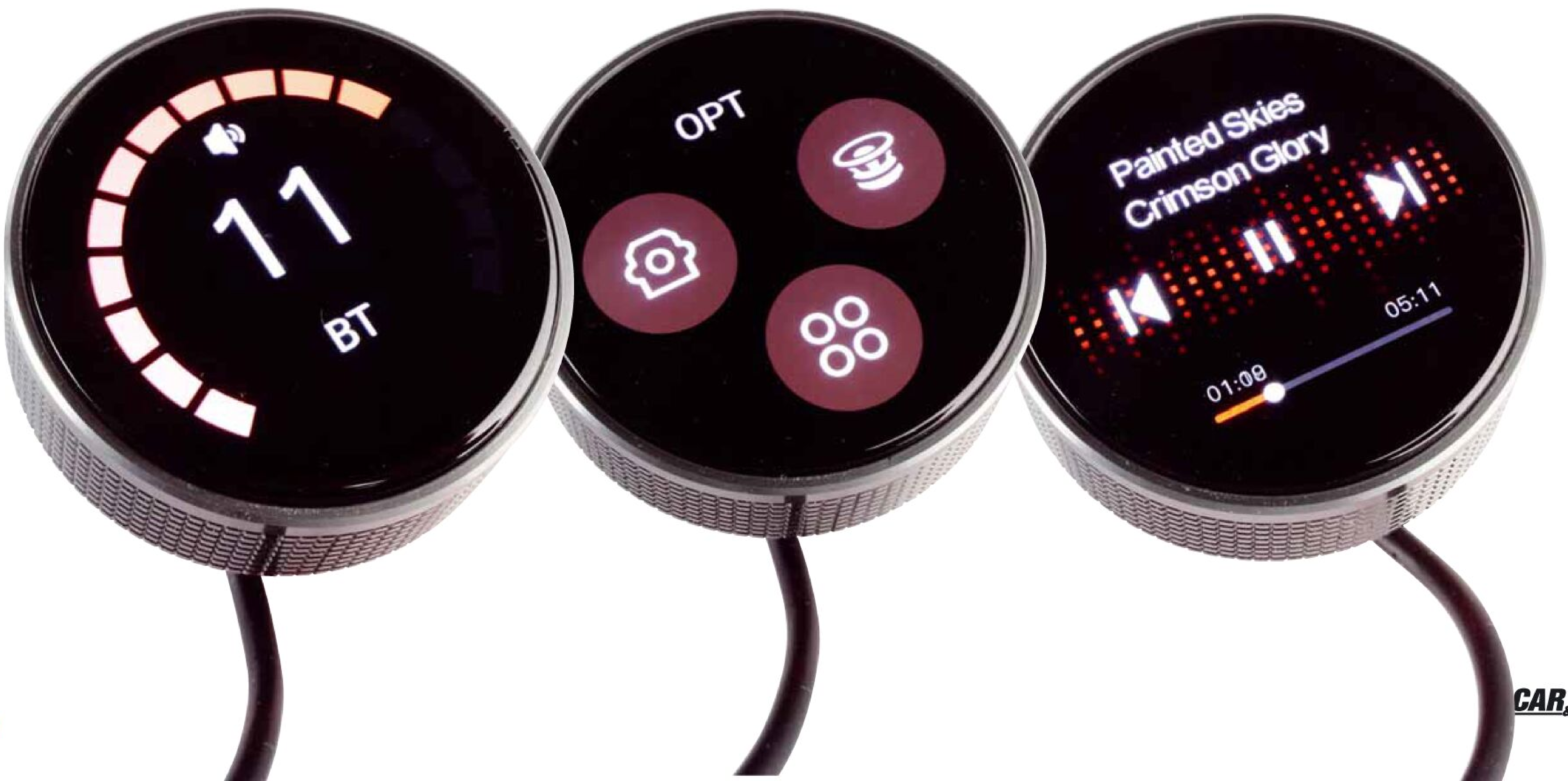
ID	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Type	PK	PK	PK	LS	PK	PK	PK	PK	PK	PK	PK	PK	PK	PK	PK	PK
Freq	20	25	32	40	50	63	80	100	125	160	200	250	315	400	500	630
Q	4.32	4.32	4.32	1.42	4.32	4.32	2.00	4.32	4.32	4.32	4.32	4.32	16.00	4.32	4.32	4.32
Gain	0.0	0.0	0.0	5.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	-15.0	0.0	0.0	0.0
Bypass	○	○	○	●	○	○	●	○	○	○	○	○	●	○	○	○

ID	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Type	PK	PK	HS	PK	HS	PK	PK	PK	PK	HS	PK	PK	PK	PK	PK
Freq	800	1000	1250	1600	2000	2500	3150	4000	5000	6300	8000	10000	12500	16000	20000
Q	4.32	4.32	1.42	4.32	0.20	4.32	4.32	4.32	4.32	0.50	4.32	4.32	4.32	4.32	4.32
Gain	0.0	-4.6	0.0	-5.8	0.0	0.0	-1.5	2.8	0.9	-3.0	0.0	0.0	0.0	0.0	0.0
Bypass	○	●	○	●	○	○	●	●	●	●	○	○	○	○	○

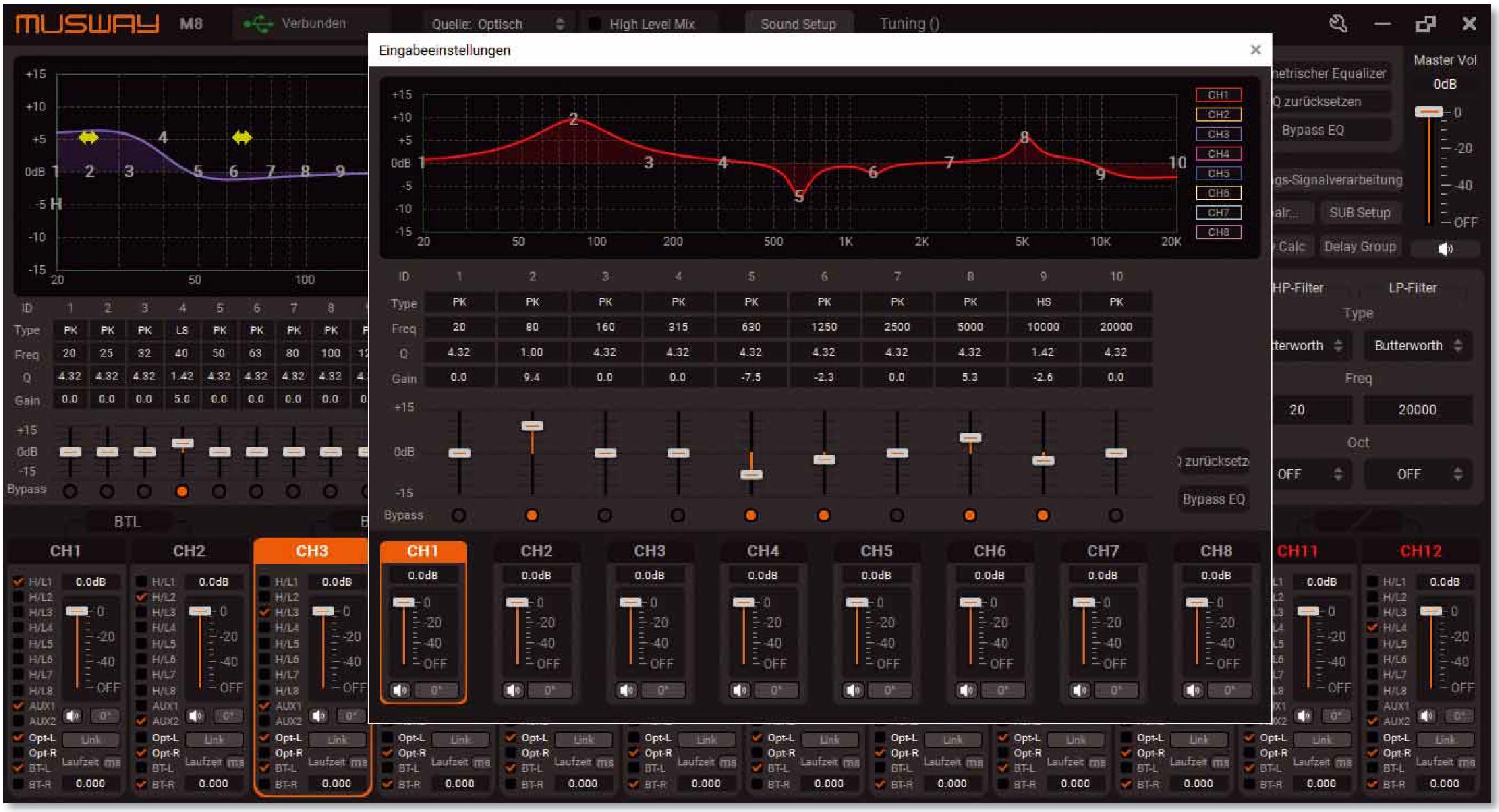
	HP-Filter	LP-Filter
Type	Butterworth	Butterworth
Freq	20	20000
Oct	OFF	OFF

The main screen manages all amplifier channels and RCA outputs. Bridged and subwoofer channels are clearly shown. At the bottom are SPL, mute, polarity reversal, link groups, and runtime controls. The checkboxes for the inputs used could also be added to the routing

1-6, the second controls inputs 7-8, and the third adjusts the stereo aux input, located nearby as two RCA jacks. Following that are four RCA outputs, which are the M8's processed outputs, giving us a total of 12 DSP channels. An optical digital input is also included, along with two accessory jacks—one serving as a digital signal input, for example, to connect Bluetooth modules. A new feature here is the BTA-HD, enabling both high-resolution audio streaming and DSP programming, effectively combining the functions of the previous BTS-HD and BTA2. The network socket next to it is intended for remote controls, and there have also been some updates to the range of accessories here. The new highlight, MyCon, is designed to appeal to fans of iDrive & Co. It arrives at a perfect time, as more people are feeling frustrated with the overuse of touchscreens in vehicles. MyCon is operated by turning and clicking, and the beautifully designed display


11
BT
OPT
Painted Skies
Crimson Glory
05:11
01:08

The new turn-and-click remote control can manage sources, setups, and volume. Bluetooth streaming display and control are also available


MUSWAY M8
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Master Vol
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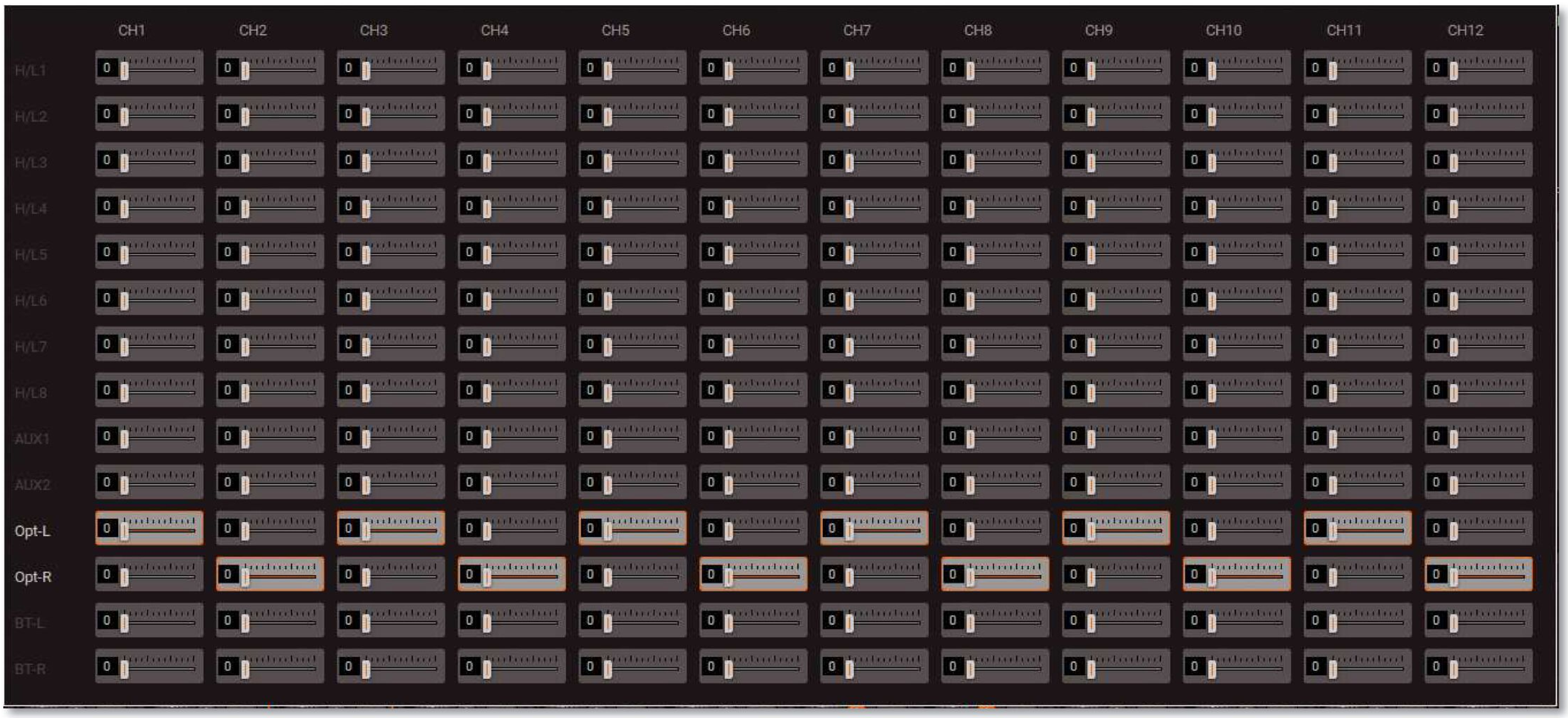
HP-Filter
LP-Filter
Butterworth
CH1
CH2
CH3
CH4
CH5
CH6
CH7
CH8
CH11
CH12

Eingabeeinstellungen

ID	1	2	3	4	5	6	7	8	9	10
Type	PK	PK	PK	PK	PK	PK	PK	PK	HS	PK
Freq	20	80	160	315	630	1250	2500	5000	10000	20000
Q	4.32	1.00	4.32	4.32	4.32	4.32	4.32	4.32	1.42	4.32
Gain	0.0	9.4	0.0	0.0	-7.5	-2.3	0.0	5.3	-2.6	0.0

Each analog input has 10 EQ bands, which can also function as all-pass and shelf filters

is touch-sensitive. Features like customizable seven-color lighting and a great user experience are impressive. It also offers the usual selection of sources and settings, including sub and master levels. Additionally, the Bluetooth streaming control, equipped with ID tags, is nicely implemented. Inside, after opening the housing, there is a strong transformer power supply and 12 power semiconductors. Musway clearly left nothing to chance here and relies on traditional technology. The first six speaker-level inputs can be switched



	CH1	CH2	CH3	CH4	CH5	CH6	CH7	CH8	CH9	CH10	CH11	CH12
H/L1	0	0	0	0	0	0	0	0	0	0	0	0
H/L2	0	0	0	0	0	0	0	0	0	0	0	0
H/L3	0	0	0	0	0	0	0	0	0	0	0	0
H/L4	0	0	0	0	0	0	0	0	0	0	0	0
H/L5	0	0	0	0	0	0	0	0	0	0	0	0
H/L6	0	0	0	0	0	0	0	0	0	0	0	0
H/L7	0	0	0	0	0	0	0	0	0	0	0	0
H/L8	0	0	0	0	0	0	0	0	0	0	0	0
AUX1	0	0	0	0	0	0	0	0	0	0	0	0
AUX2	0	0	0	0	0	0	0	0	0	0	0	0
Opt-L	0	0	0	0	0	0	0	0	0	0	0	0
Opt-R	0	0	0	0	0	0	0	0	0	0	0	0
BT-L	0	0	0	0	0	0	0	0	0	0	0	0
BT-R	0	0	0	0	0	0	0	0	0	0	0	0

Routing is clearly organized and easy to follow

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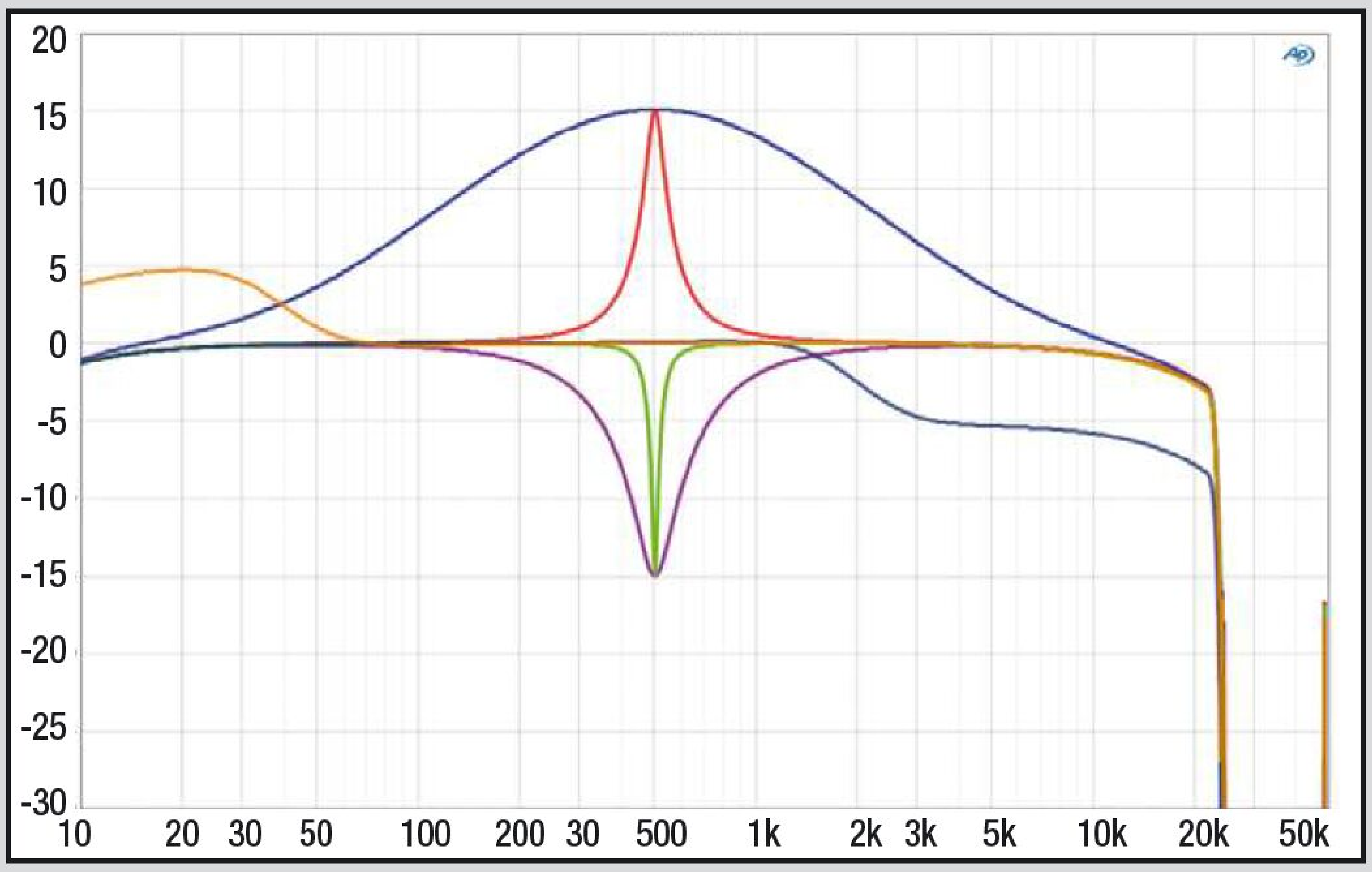
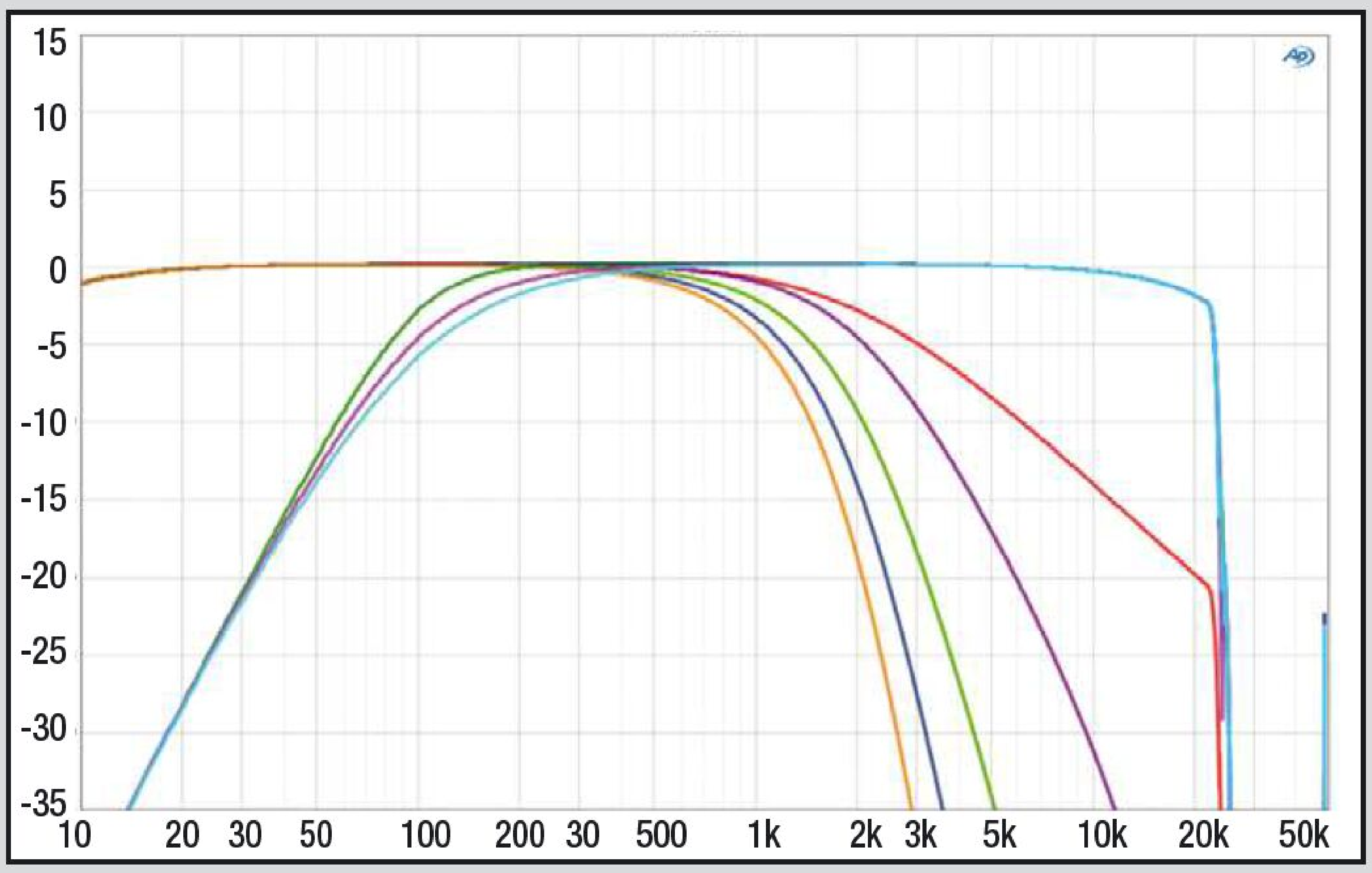
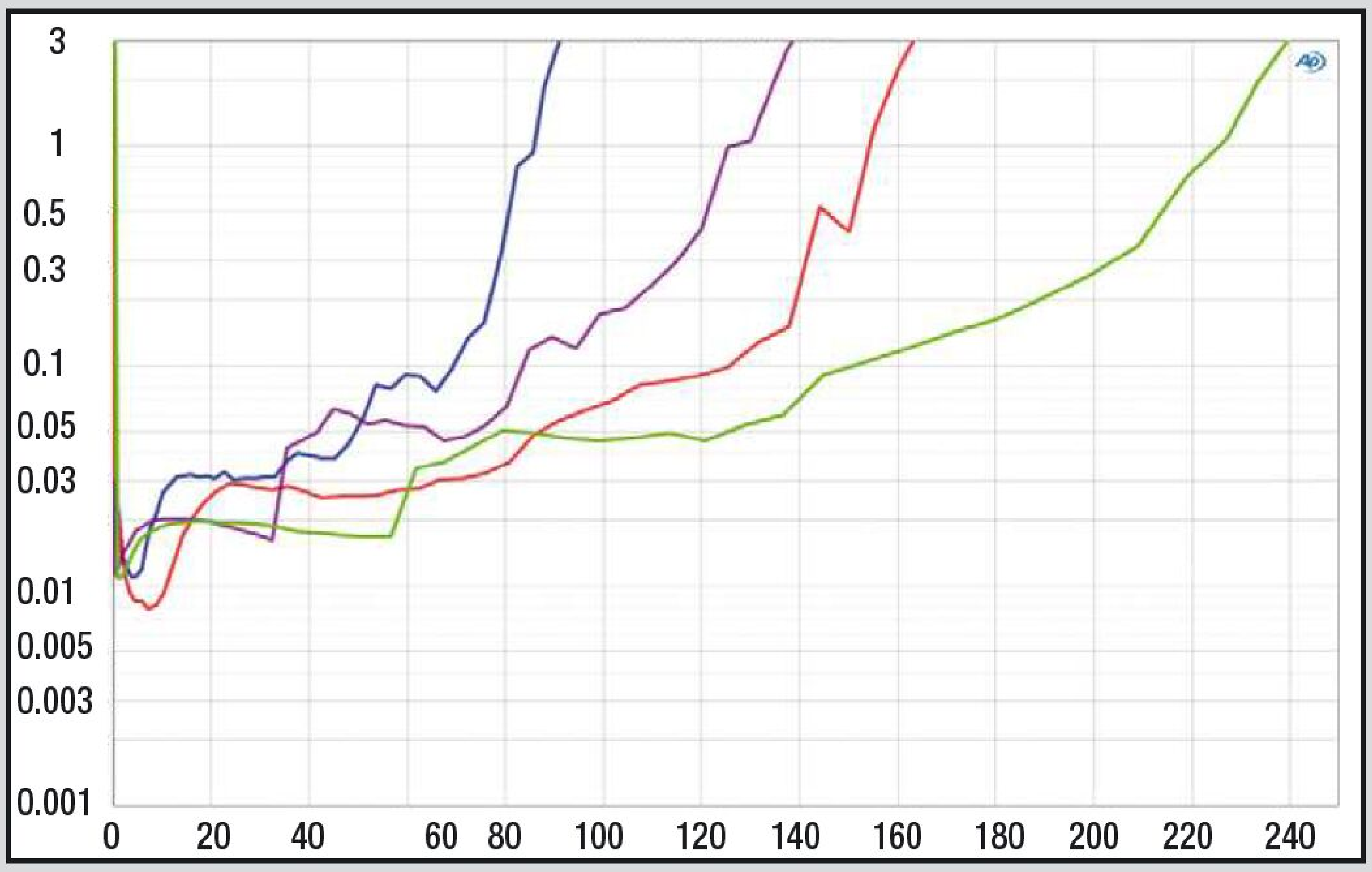


The EQ bands can serve as shelf or all-pass filters, and naturally as parametric equalizers



The crossovers operate smoothly, with left high pass at 100 Hz, 12 dB Butterworth, Bessel, Linkwitz; right low pass at 2 kHz, Bessel, 6-48 dB



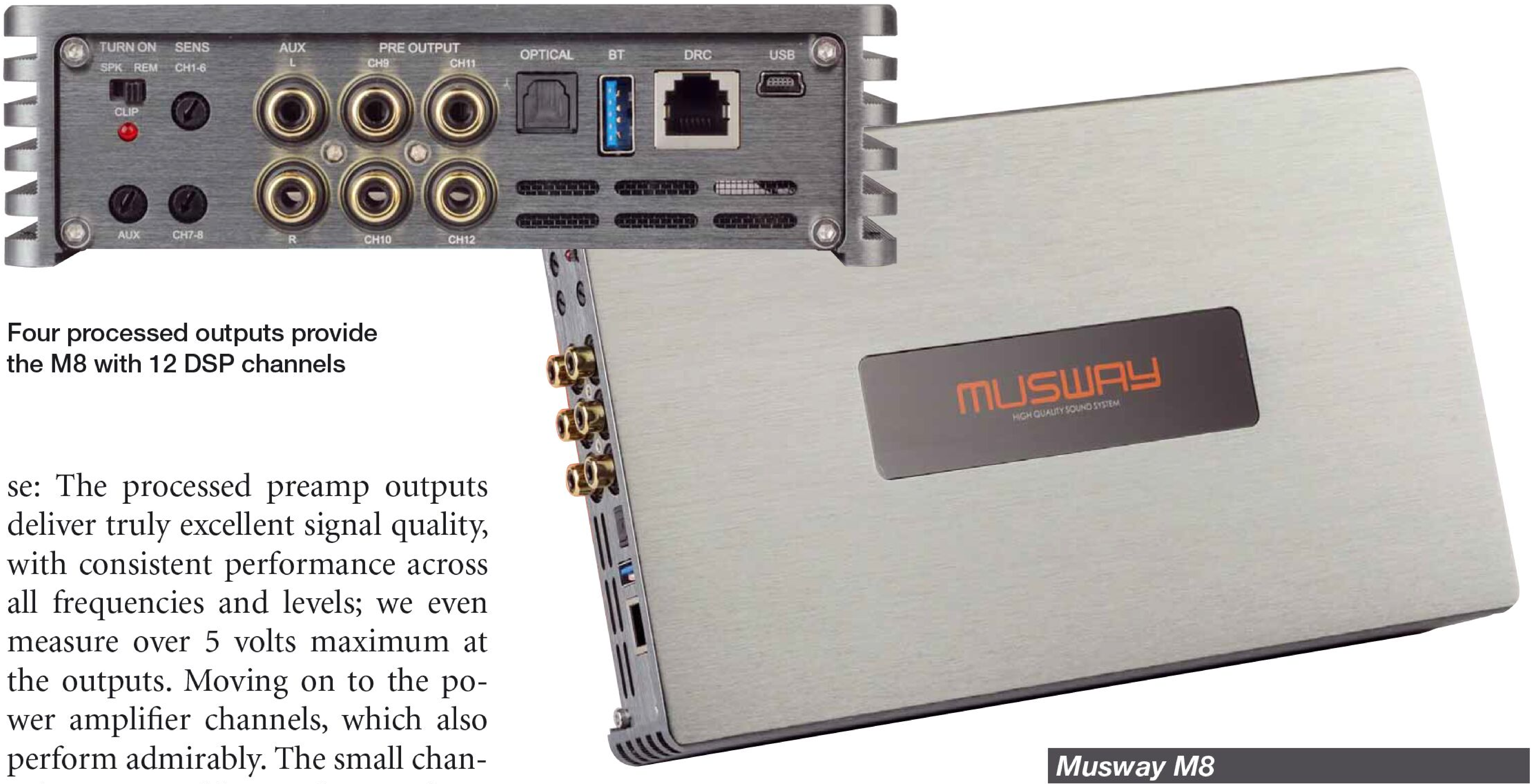
Blue and red: channels 1-6 at 4 and 2 ohms;
purple and green: channels 7 and 8 at 4 and 2 ohms

to low level in pairs using a jumper, and there are cable harnesses with RCA sockets. Inputs 7 and 8 support an input sensitivity of up to 30 volts, making them suitable for large factory amplifiers. Overall, channels 7 and 8 are fundamentally different from the first six; they are high-power channels with more output. This is visible because Musway uses external MOSFETs and larger Class D coils for these channels. Channels 1-6, however, are highly modern, equipped with two-channel amplifier ICs that handle all the amplification. Between the operational amplifier stages of the inputs, there is a DSP, which is expected given the ST 32-bit processor, along with two converter modules. Two Burr Brown PCM3168s manage both analog-to-digital and digital-to-analog conversions.

The chips can handle six inputs and eight outputs, so the M8 is quite capable in this aspect. Musway has concealed the DSP chip beneath the board, but you can be sure that an ADAU1452 is installed, mostly due to the existing software. This feature is new, though it is only obvious upon a second look. Everything appears the same as before, including the app (which was still in development during testing). In the software, now called Tunest PC, we found a new feature: the input signal processing section, which was previously missing. This section offers a 10-band EQ for each of the eight speaker-level inputs, with the same capabilities as the outputs. The software will be backward compatible with all DSP products, at least according to the demo mode.

Measurements and sound

Before we discuss the amplifier and overall performance, let us first examine the software-related features. The 48 kHz sampling rate limits the audio frequency response to 24 kHz—no issue, as with so many channels, the DSP cannot handle 96 kHz since it would require twice as many calculations per second. Musway has also been working behind the scenes, and we are impressed with the clean solution for full-scale control of the digital input, which now outputs maximum power at 0.8 FS (full scale), meaning at 80% digital signal level. The crossovers have also been reprogrammed and are now nearly perfect. The nonsensical odd Linkwitz orders are gone, and the Bessel filters now perform as expected. A minor inaccuracy has arisen: the Butterworth filter oscillates slightly at the steepest setting of 48 dB—but that is a minor issue! While being on the topic of prai-



Four processed outputs provide the M8 with 12 DSP channels

se: The processed preamp outputs deliver truly excellent signal quality, with consistent performance across all frequencies and levels; we even measure over 5 volts maximum at the outputs. Moving on to the power amplifier channels, which also perform admirably. The small channels 1-6 are stable at 2 ohms and can be bridged, delivering 86 watts at 4 ohms and 154 watts at 2 ohms—that is already quite a lot. However, the external MOSFETs in channels 7 and 8 provide 131 watts and 226 watts, respectively, which theoretically gives a 4-ohm subwoofer 452 watts. All this also scores high marks for distortion, with residual noise measured at only -94 dB. In practice, the M8 demonstrates raw power and enthusiasm. It always sounds like it has plenty of power to spare, and the amplifier maintains a strong sense of control. Additionally, the M8 produces beautiful vocals and instrument sounds, and it excels with plenty of punch and dynamics in percussive passages.

Conclusion

The M8 has performed exceptionally well overall. It stands out with its pristine hardware and is continually enhancing its software. Possibly the best Musway we‘ve tested so far.

Elmar Michels

Specifications

Channels	8
Channel power 4 ohms W	6 x 86 + 2 x 131
Channel power 2 ohms W	6 x 154 + 2 x 226
Channel power 1 ohms W	–
Bridged power W	3 x 308 + 1 x 452
System power W	1006
Sensitivity max. mV	390
Sensitivity min. V	3,0
THD+N (<22 kHz) 5W	0,01/0,016
THD+N (<22 kHz) half power	0,04/0,05
Signal-to-noise ratio dB(A)	94/94
Damping factor 20 Hz	118/103
Damping factor 80 Hz	118/102
Damping factor 400 Hz	116/100
Damping factor 1 kHz	103/92
Damping factor 8 kHz	12/13
Damping factor 16 kHz	4/4

Features

Low pass	20 – 20k Hz
High pass	20 – 20k Hz
Band pass	20 – 20k Hz
Bass boost	-12 – 12 dB/20 – 20k Hz
Subsonic filter	via HP
Phase shift	via DSP
High-level inputs	• 8 CH
Auto turn-on	•, DC
RCA output	•, 4CH, processed
Start/stop capable	• (6,8 V)
Dimensions (L x W x H mm)	250 x 150 x 50
Others	12-channel DSP

Musway M8

Price	**1.000 Euro**
Contact	Audio Design, Germany
Internet	www.musway.de/english/

Rating

◗ Sound	40 %	★★★★★
Bass	8 %	★★★★★
Neutrality	8 %	★★★★★
Transparency	8 %	★★★★★
Spatial imaging	8 %	★★★★★
Dynamics	8 %	★★★★★
◗ Lab	35 %	★★★★★
Power	20 %	★★★★★
Damping factor	—	—
Signal-to-noise ratio	5 %	★★★★★
Noise	10 %	★★★★★
◗ Practice	25 %	★★★★★
Features	15 %	★★★★★
Build quality electronics	5 %	★★★★★
Build quality mechanics	5 %	★★★★★

Absolute Top Class

★★★★★

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Price/performance: very good

„Flawlessly done – perhaps the best Musway yet.“

ESX QS-Four-BT-ISO
– Micro Four-channel Amplifier with Bluetooth

Streaming Marvel

With the QS-TWO-BT, ESX has led the way in offering tiny amplifiers as simple Bluetooth retrofits. Now, with the QS-Four-BT, a four-channel model is available.

VERSATILITY AWARD
Upper Class
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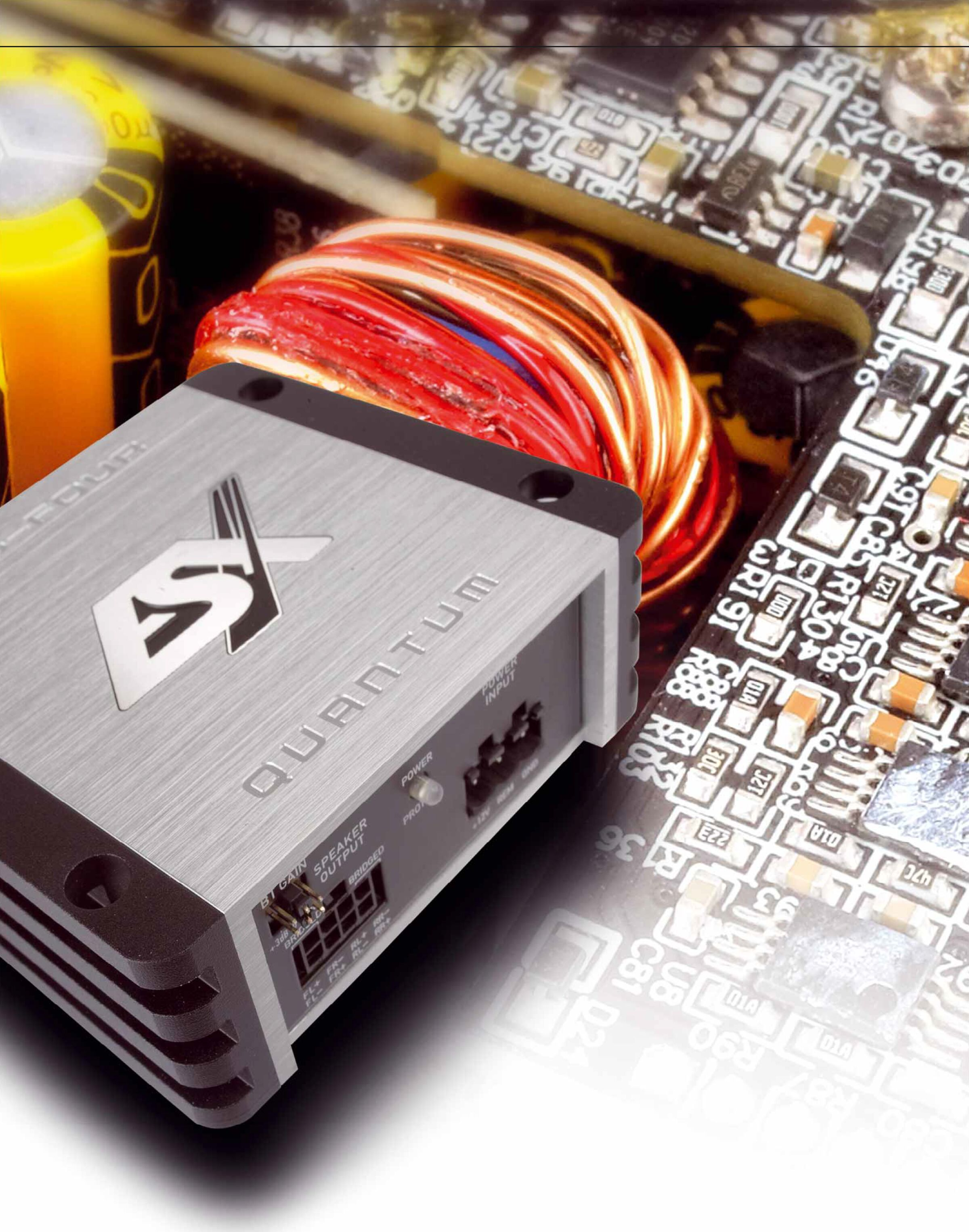
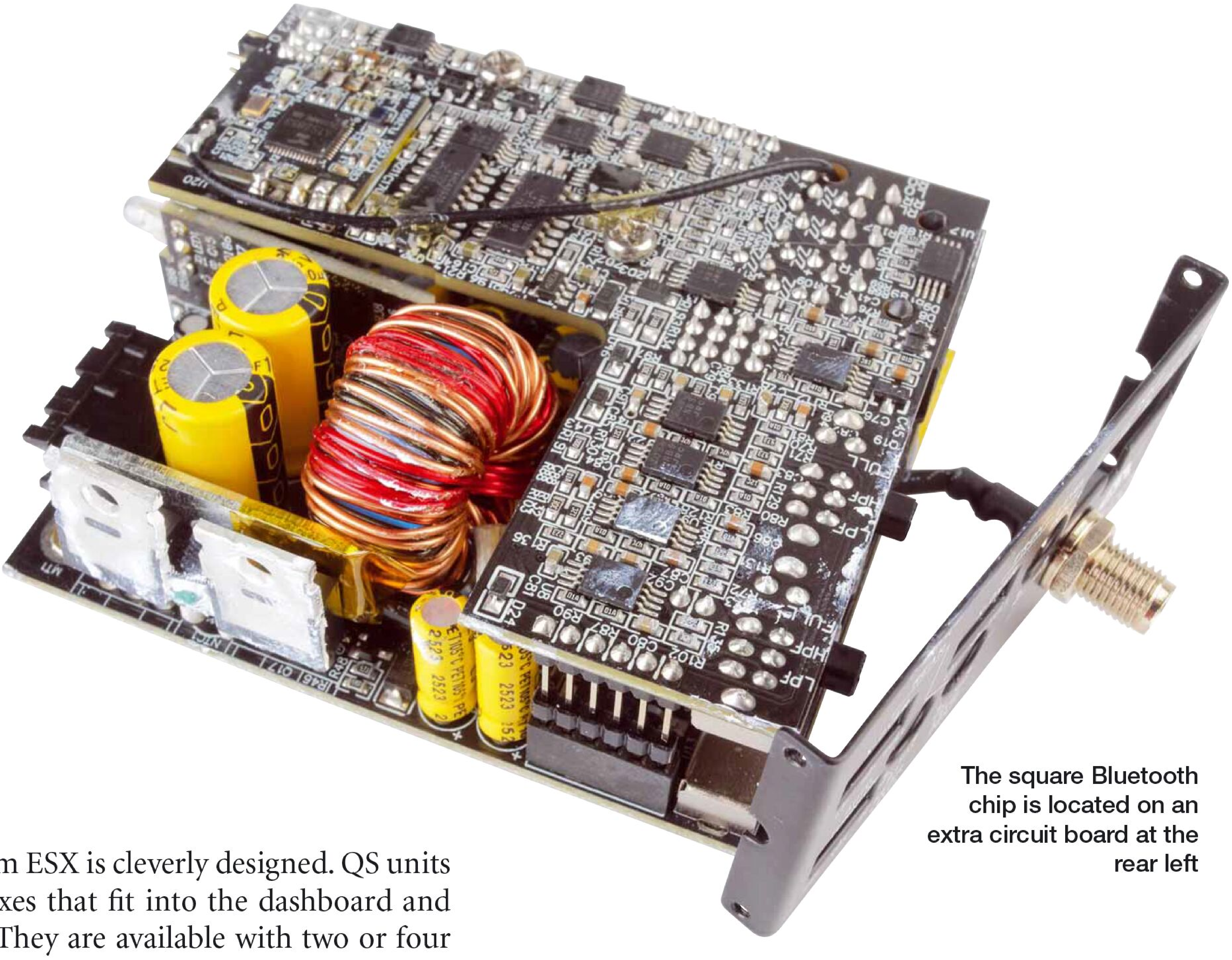
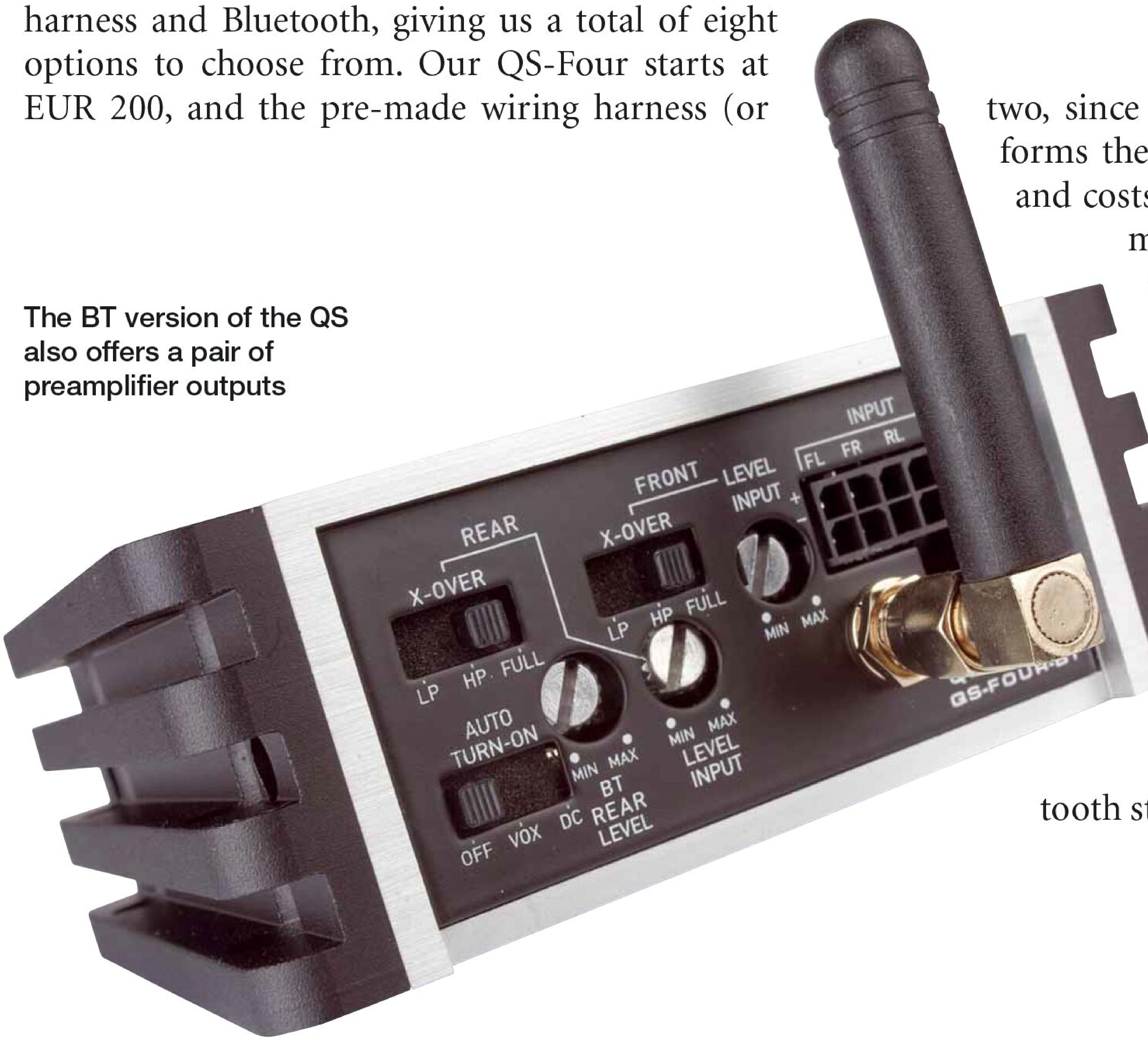
BEST EMC
Undisturbed FM reception
CAR&HiFi INTERNATIONAL 3/25


QUANTUM
POWER
PROT
POWER INPUT
+12V
REM
GND
BT GAIN
+3dB
SPEAKER OUTPUT
BRIDGED
FL+
FL–
FR–
FR+
RL+
RL–
RR–
RR+



The square Bluetooth chip is located on an extra circuit board at the rear left

The QS series from ESX is cleverly designed. QS units are compact boxes that fit into the dashboard and are easy to retrofit. They are available with two or four channels and can optionally include an ISO wiring harness and Bluetooth, giving us a total of eight options to choose from. Our QS-Four starts at EUR 200, and the pre-made wiring harness (or two, since there are two) with ISO plugs transforms the QS-Four into a plug-and-play device and costs an additional EUR 25. The Bluetooth module, which is neatly integrated into the housing so that no cable dangling dongle is needed, also costs 25 EUR. Of course, the module supports Bluetooth 5, so you don‘t have to worry about sound quality. It‘s an ingenious and affordable solution. Whether you see it as a small sound upgrade or a Bluetooth retrofit with a small amplifier, it’s a great concept—especially since not everyone wants to retrofit a full DSP amplifier just for Bluetooth streaming.


INPUT
FL FR RL
FRONT
X-OVER
LEVEL INPUT
LP HP FULL
MIN MAX
REAR
X-OVER
LP HP FULL
AUTO TURN-ON
OFF VOX DC
MIN MAX
BT REAR LEVEL
MIN MAX
LEVEL INPUT
QS-FOUR-BT

The BT version of the QS also offers a pair of preamplifier outputs

HELIX NEXT

V EIGHT DSP **ULTIMATE**

Best Product:
In-Car DSP Amplifier

EISA AWARD Best Product 2025-2026
IN-CAR DSP AMPLIFIER
HELIX V EIGHT DSP ULTIMATE

HELIX
V EIGHT DSP
ULTIMATE
MADE IN GERMANY
STATUS
CONTROL
EXTENSION CARD 2.0
HIGHLEVEL INPUT
REM OUT
HIGHLEVEL INPUT

The HELIX V EIGHT DSP ULTIMATE is the highly innovative, powerful, and versatile upgrade solution.

DSP PC-TOOL 6

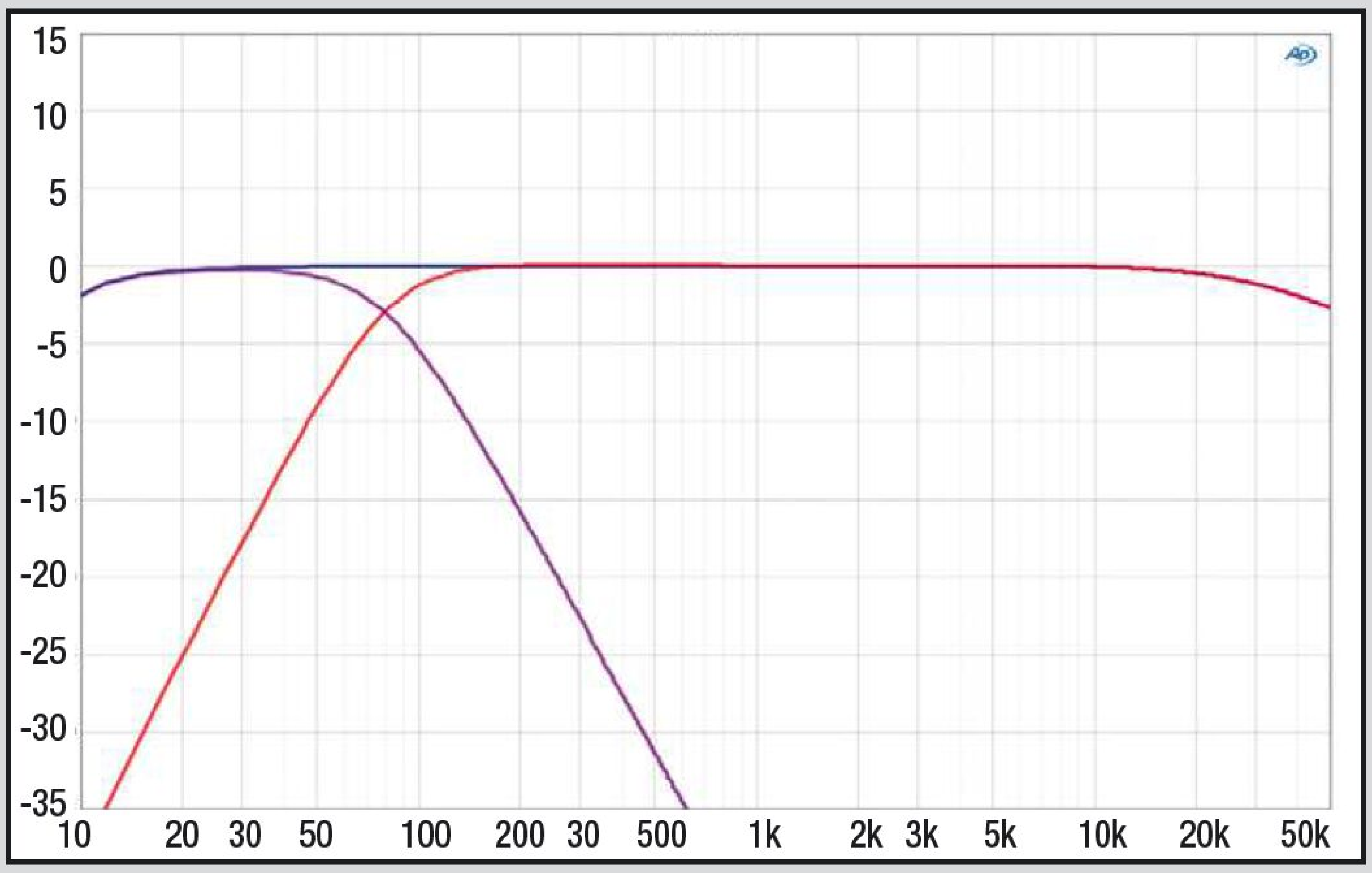
DSP PC-TOOL
6
BRAX I HELIX I MATCH

Best Product:
In-Car DSP Software

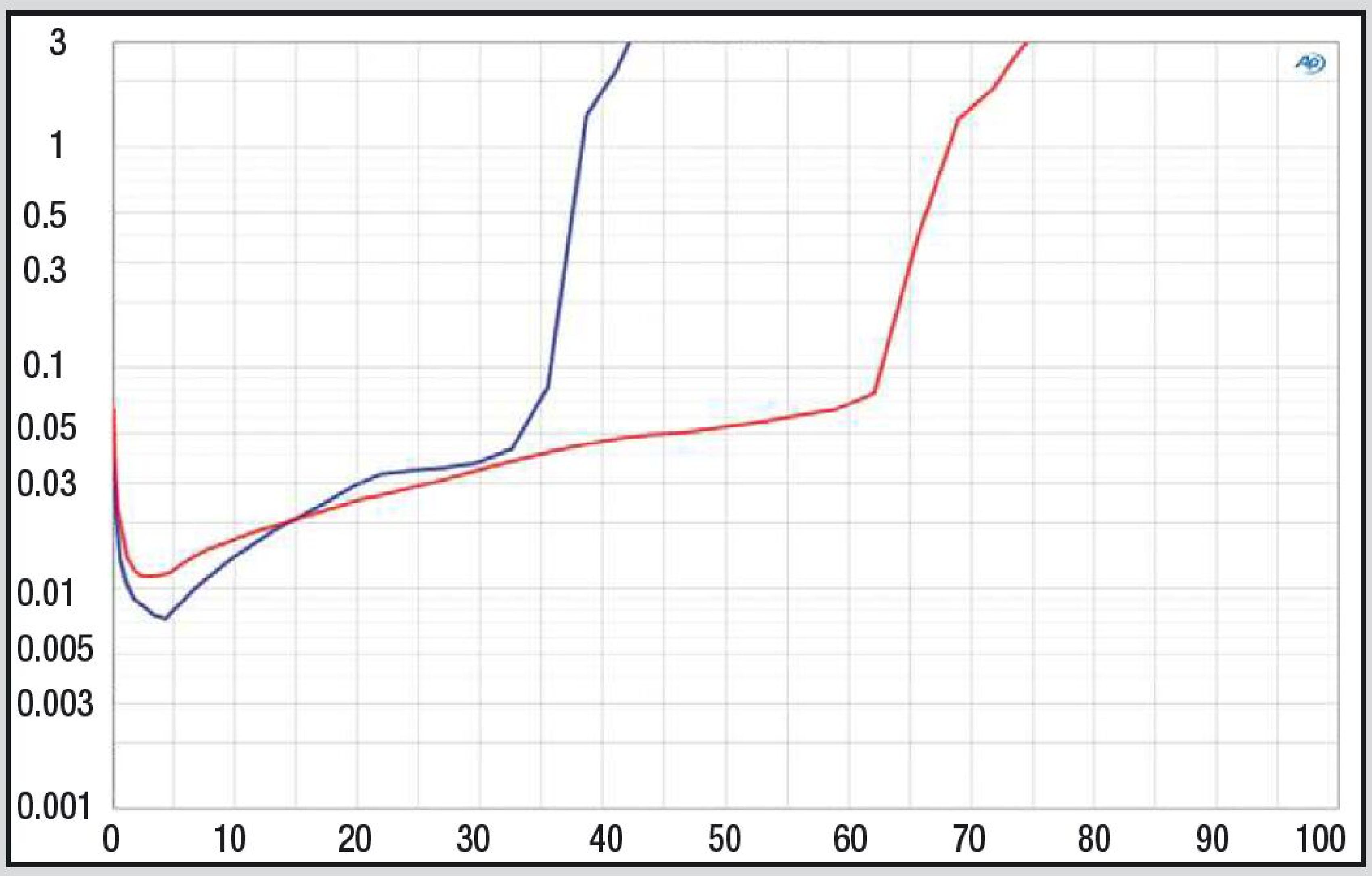
EISA AWARD Best Product 2025-2026
IN-CAR DSP SOFTWARE
DSP PC-Tool 6

With DSP PC-Tool 6, professional sound tuning becomes smarter, faster, and more powerful than ever before.

CAR&HIFI Laboratory



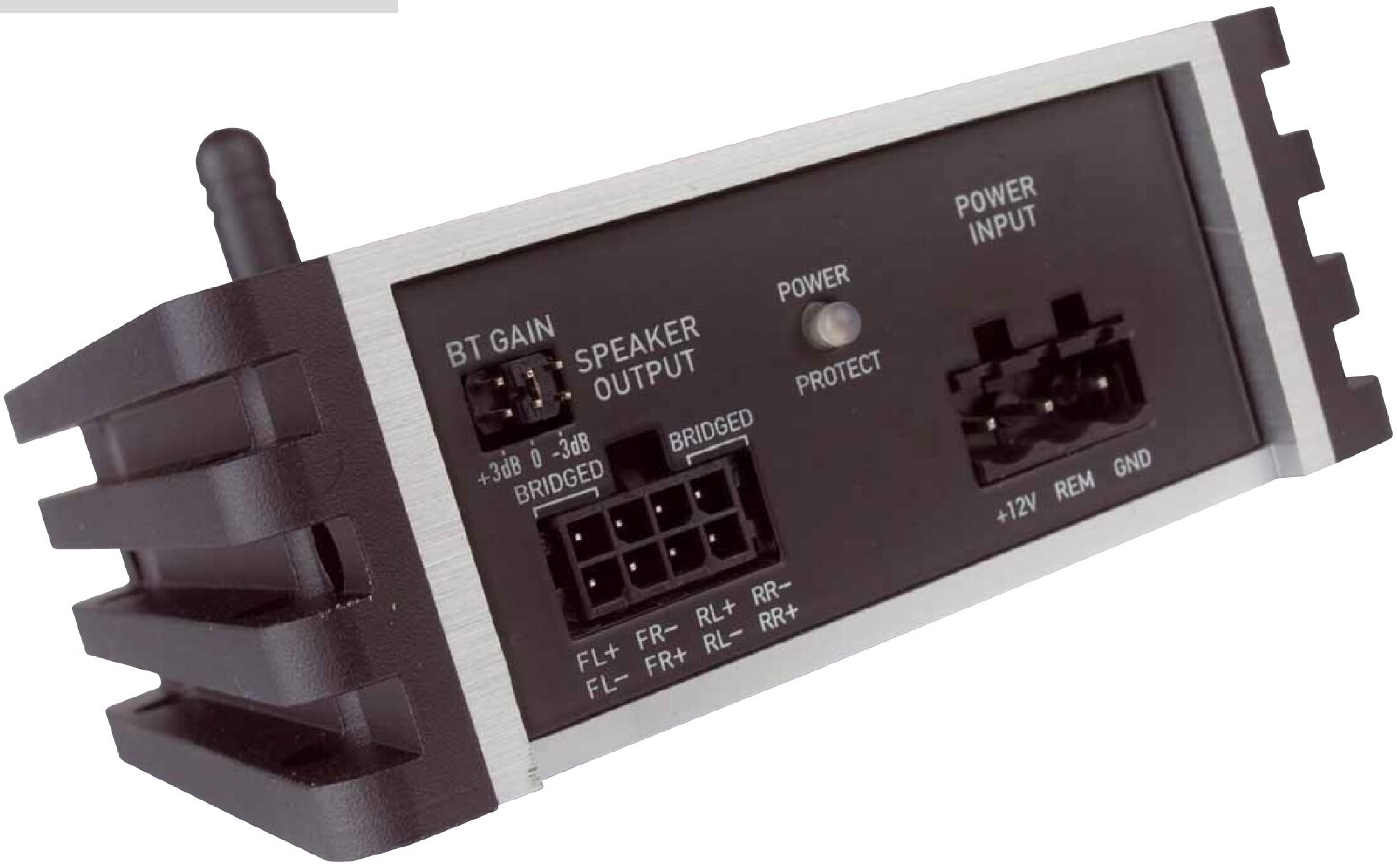
High-pass or low-pass at 80 Hz, driving small woofers or weak speakers



With 38 watts, the QS-Four doesn‘t break any records, but it‘s enough for a decent SPL. The 68 watts at 2 ohms result in 136 watts in bridged mode, enough for a small woofer

Regardless which version, the QS-Four accepts four-channel signals, whether they are low-level or high-level sources, such as an original radio. It also features a stereo output, making it easy to add an extra amplifier to the system, for example, for footwell woofers or an active subwoofer. The features are somewhat limited, with only one switch per channel pair that can select either bass or mid-high frequencies, plus a separate control to adjust the Bluetooth volume. The Bluetooth cannot be operated via hardware; it turns on automatically when a paired device starts playing music.

Because of its small size, dismantling the QS-Four is much more complicated than with a larger amplifier. It has at least three times as many screws to securely attach the chips and power supply transistors to the housing, since the QS-Four has limited cooling surface area despite the screw-on heatsinks. Amplification is, of course, handled by an IC. No one would consider fitting four pairs of MOS-FETs onto a small 72 x 61 mm circuit board; the QS-Four is already densely packed, with two layers. At the bottom, there is a small transformer power supply with a few buffer capacitors, and two daughter boards—one for power supply control and another on which the Class D low-pass coils are mounted. At the top, the signal processing section contains numerous operational amplifiers and also includes the Bluetooth module, which has been integrated into the QS-Four as a complete circuit board.



There is no space for terminals here; there is a jumper and a pot for the Bluetooth gain

Measurements and Sound

The QS-Four-BT performs quite well in our tests. While no one expects kilowatts of power from a small 90 x 80 mm amplifier, it should still deliver significantly more than an original radio; otherwise, retrofitting isn‘t worth it. And it easily does this. ESX specifies the QS-Four as 35 watts at 4 ohms and 60 watts at 2 ohms, and we exceed these specs by another 8 watts each. Everything else with our QS-Four is also fine; there is no distortion or excessive residual noise. Sound-wise, it provides much more than you‘d expect from four channels in such a small box. The volume level is more than enough on a high-efficiency component system, and the QS-Four impresses with its attention to detail at low volumes. Female voices are its forte, along with percussive sounds that seem to come out of nowhere. All of this is easily enough to refresh the sound, and the CD-quality Bluetooth also has nothing to hide.

Conclusion

Four channels plus Bluetooth in a compact size—ESX is tough to beat in that area. The QS-Four-BT stands out as an ISO with simple, plug-and-play setup, making it a versatile option for easy streaming and quick upgrades.

Elmar Michels

QS-FOUR
ESX
QUANTUM
BT GAIN
+3dB 0 +6dB
SPEAKER OUTPUT
BRIDGED
BRIDGED
FL+ FL− FR− FR+ RL+ RL− RR− RR+
POWER
PROTECT
POWER INPUT
+12V REM GND

Specifications

Channels	4
Channel power 4 ohms W	38
Channel power 2 ohms W	68
Channel power 1 ohms W	0
Bridged power 4 ohms W	136
Bridged power 2 ohms W	240
Sensitivity max. mV	200
Sensitivity min. V	4,7
THD+N (<22 kHz) 5W	0,008
THD+N (<22 kHz) half power	0,021
Signal-to-noise ratio dB(A)	99
Damping factor 20 Hz	81
Damping factor 80 Hz	85
Damping factor 400 Hz	83
Damping factor 1 kHz	82
Damping factor 8 kHz	32
Damping factor 16 kHz	11

Features

Low pass	80 Hz
High pass	80 Hz
Band pass	–
Bass boost	–
Subsonic filter	–
Phase shift	–
High-level inputs	•
Auto turn-on	•, DC or signal
RCA output	•, 4CH, processed
Start/stop capable	• (6,8 V)
Dimensions (L x W x H mm)	90 x 80 x 35
Others	EPS, ISO harness

ESX QS-Four-BT-ISO

Price	250 Euro
Contact	Audio Design, Germany
Internet	www.audiodesign.de/english

Rating

Sound	40 %	★★★★⯪
Bass	8 %	★★★★★
Neutrality	8 %	★★★★★
Transparency	8 %	★★★★☆
Spatial imaging	8 %	★★★★★
Dynamics	8 %	★★★★☆
Lab	35 %	★★★⯪☆
Power	20 %	★★★☆☆
Damping factor	5 %	★☆☆☆☆
Signal-to-noise ratio	5 %	★★★★★
Noise	5 %	★★★★★
Practice	25 %	★★★★★
Features	15 %	★★★★★
Build quality electronics	5 %	★★★★★
Build quality mechanics	5 %	★★★★★

Upper Class

★★★★⯪

CAR&HiFi
INTERNATIONAL Germany 3/25

Price/performance: excellent

Ingenious streaming retrofit in the smallest of footprints.

Audio System R-125.4 – old-school analog power

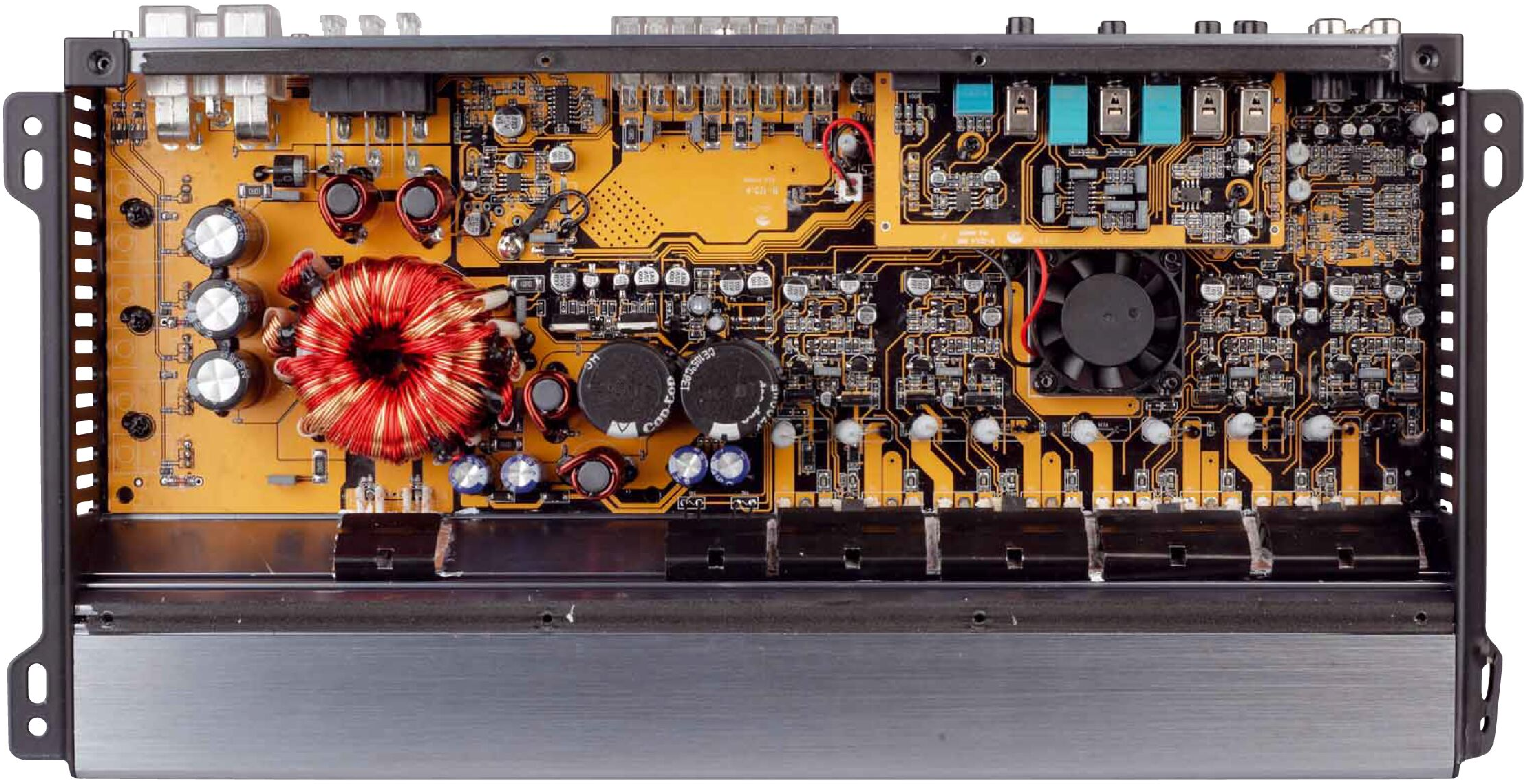
Tuned for Sound Quality

A large Class AB amplifier seems almost forgotten today among many practical digital amplifiers available. Audio System still offers them, now even brand new as the R-125.4.

BEST PRODUCT
Top Class
CAR&HiFi
INTERNATIONAL 3/25

AUDIO SYSTEM
R SERIES BY AUDIO SYSTEM
R-125.4
REMOTE

Yes, of course. “Analog” amplifiers using Class AB technology are on their way out. In many modern vehicles, saving electricity is the order of the day, with car audio systems having to share the permitted power consumption with all other 12-volt devices. Efficiency is key; otherwise, there won‘t be enough for everyone. An “analog” amplifier, on the other hand, has such poor efficiency that it almost saves on heating – a perfect match for the combustion engine, which also provides more waste heat than propulsion. But enough of the introduction, a Class AB amplifier still offers many advantages from a hi-fi perspective, not least because sound enthusiasts often still swear by analog. Our candidate is the R-125.4, a four-channel amplifier from Audio System‘s mid-range product line, i.e., neither Entry Level nor super-expensive. Its size and shape are reminiscent of its predecessor, as is the arrangement of the connections and controls, but it is clear that Audio System has done more than give it a facelift. The enlarged heatsink, which is still located along the entire rear longitudinal side of the housing and equipped with cooling fins hidden under a perforated plate, ensures a healthy thermal balance. The aluminum extruded body extends over the top of the housing and across the front panel, creating a much more sophisticated design than standard models. The very solid terminal blocks for power and speakers are familiar, as are the externally accessible fuses. There is also an optional remote control and a complete, well-designed filter system. All channels have a bandpass that varies from one to another, forming an asymmetrical setup. The front channels are specialized for high-pass up to 4 kHz, while the rear channels provide matching low-pass filters, with the corresponding low- and high-pass filtering up to 500 Hz. A notable feature is the FSA (Front Stage Adjust), an analog phase shift for channel 1, which allows you to move the stage‘s center back and forth slightly with the knob. The FSA can be turned off, as can all high and low passes separately, so only what is needed stays in the signal path. With active control via DSP, you get only the pure amplifier for optimal sound quality – that‘s the goal! At first glance, the interior design of the R may seem old-fashioned, but it is state-of-



The layout and component choices are entirely new, and a regulated fan supplies cooling when necessary

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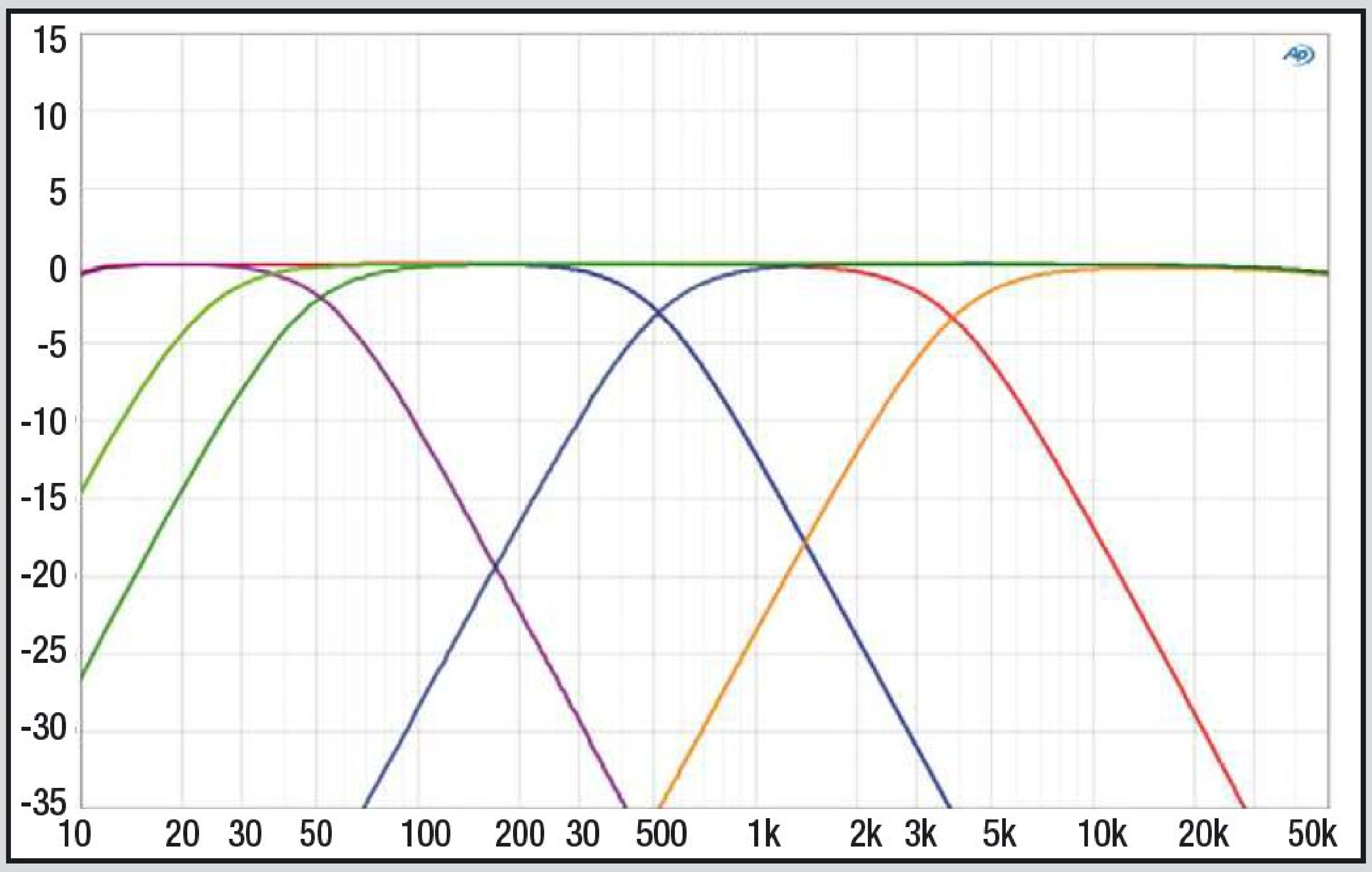
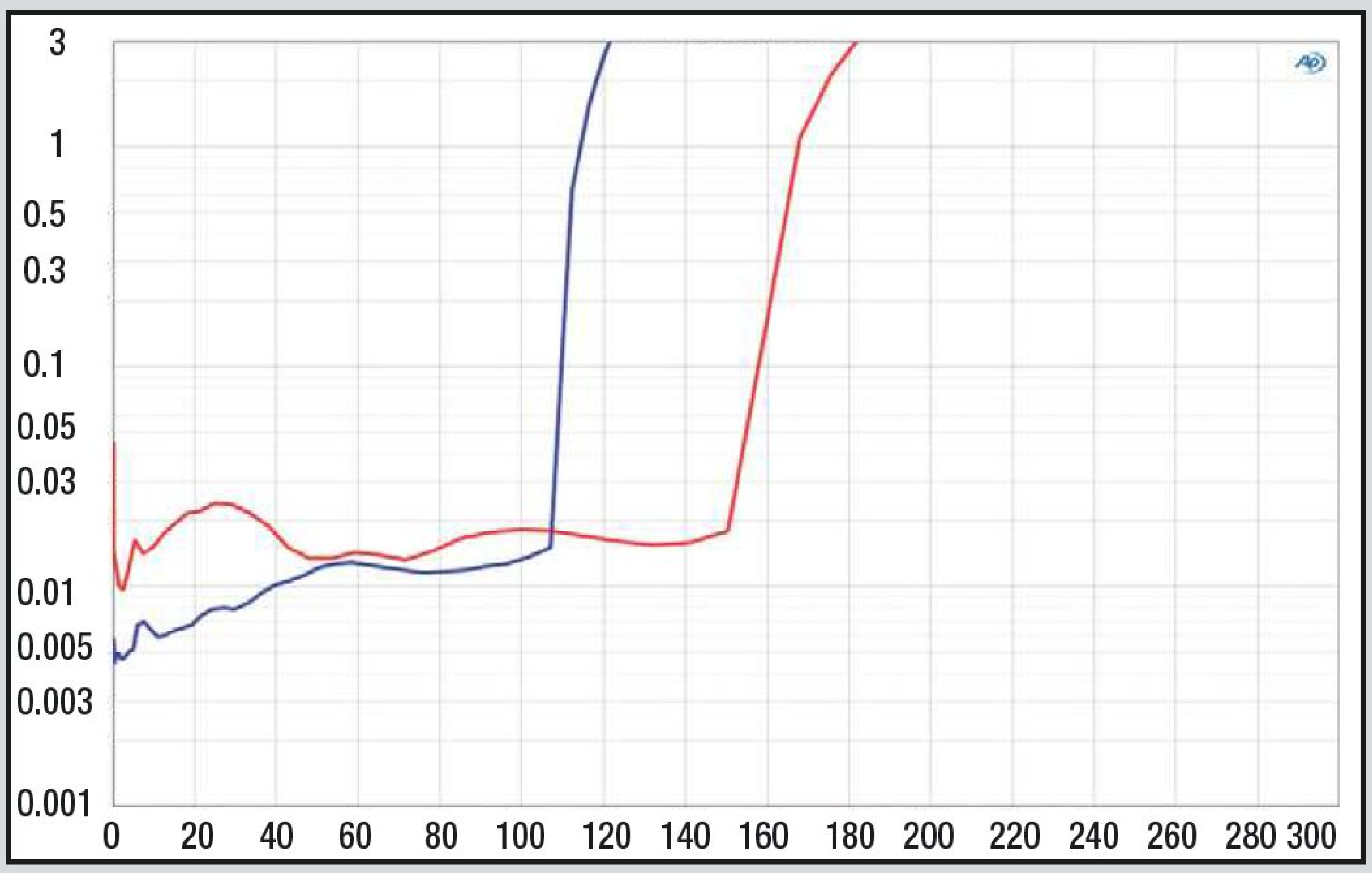
CAR&HIFI Laboratory



The variable bandpass filters extend up to the tweeter at the top and also enable subsonic filtering at the bottom

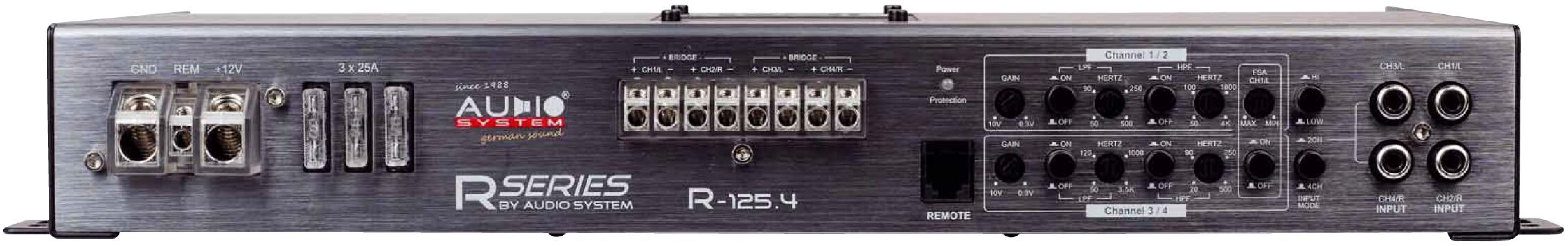


Nearly perfect distortion curve; the hard clipping edge at the power limit is typical for Class AB

the-art in manufacturing technology and ensures very high quality overall. The fact that analog amplifiers are still relevant at Audio System is demonstrated by the completely new design, including updated layout, new components, and other improvements. The details are also innovative: for the first time, an automatic switch-on function responds to both DC offset and AC signals, and it does not require manual switching. The power supply is generous and can easily support the power demands of the four channels, with good filtering and buffering. The attractive light orange circuit board provides plenty of space for discrete construction of the analog channels. Some of the power supply transistors are located under the circuit board, while others are attached to the rear heatsink, where the large MOSFETs of the power amplifier are also mounted. The system is cooled by a fan that draws air from the narrow space beneath the circuit board, with additional intake openings in the side panels of the housing. Overall, the fan did not bother us, as it never activated.

Measurements and Sound

To get straight to the point: this device is incredibly impressive. Rarely has an amplifier performed so cleanly, regardless of how you push it during testing. But one thing must be clear: the R-125.4 is not a power beast. We found it delivers just 4 x 115 watts into 4 ohms, which is, of course, enough for all situations. But it‘s nothing to boast about; others can do better. The picture chan-


GND
REM
+12V
3 x 25A
since 1988
AUDIO SYSTEM
german sound
R SERIES
BY AUDIO SYSTEM
R-125.4
BRIDGE
BRIDGE
Power
Protection
REMOTE
Channel 1 / 2
Channel 3 / 4
GAIN
LPF
HPF
HERTZ
FSA
INPUT MODE
CH3/L
CH1/L
CH4/R INPUT
CH2/R INPUT

Solid terminals and generous filter equipment in the current R-125.4

AUDIO SYSTEM

ges when you consider other measurement values, as the R offers, for example, an SNR that cramped layouts can only dream of. And the distortion curve? Simply remarkably good. So, it‘s no surprise that the R also impresses with its sound quality. It creates plenty of space and reproduces musical events effortlessly. It handles sharp highs just as well as airy details, and even in the bass and fundamental range, it offers rich punch and more than enough attack. Additionally, it reproduces voices and instruments with perfect clarity, as only the best playback systems can.

Conclusion

The R-125.4 is currently the benchmark for analog amplifiers under $1,000. If you are not concerned about marginal issues like efficiency or waste heat, the Audio System provides excellent performance.

Elmar Michels

Specifications

Channels	4
Channel power 4 ohms W	115
Channel power 2 ohms W	169
Channel power 1 ohms W	0
Bridged power 4 ohms W	338
Bridged power 2 ohms W	592
Sensitivity max. mV	170
Sensitivity min. V	6,1
THD+N (<22 kHz) 5W	0,005
THD+N (<22 kHz) half power	0,013
Signal-to-noise ratio dB(A)	106
Damping factor 20 Hz	987
Damping factor 80 Hz	1063
Damping factor 400 Hz	837
Damping factor 1 kHz	781
Damping factor 8 kHz	761
Damping factor 16 kHz	621

Features

Low pass	50 – 500 Hz (CH12), 50 – 3,5k Hz (CH34
High pass	10 – 4k Hz (CH12), 20 – 500 Hz (CH34)5
Band pass	10 – 500 Hz (CH12), 20 – 3,5k Hz (CH34
Bass boost	–
Subsonic filter	via HP
Phase shift	–
High-level inputs	• (Adapter)
Auto turn-on	•, DC or signal
RCA output	–
Start/stop capable	• (6,5 V)
Dimensions (L x W x H mm)	360 x 190 x 53
Others	Filter bypass, 2 or 4 CH In

Audio System R-125.4

Price	350 Euro
Contact	Audio System, Germany
Internet	audio-system.de/english/

Rating

◗ Sound	40 %	★★★★★
Bass	8 %	★★★★★
Neutrality	8 %	★★★★★
Transparency	8 %	★★★★★
Spatial imaging	8 %	★★★★★
Dynamics	8 %	★★★★★
◗ Lab	35 %	★★★★★
Power	20 %	★★★★☆
Damping factor	5 %	★★★★★
Signal-to-noise ratio	5 %	★★★★★
Noise	5 %	★★★★★
◗ Practice	25 %	★★★★☆
Features	15 %	★★★★☆
Build quality electronics	5 %	★★★★☆
Build quality mechanics	5 %	★★★★★

Top Class

★★★★⯪

CAR&HiFi INTERNATIONAL Germany 3/25

Price/performance: excellent

Exceptionally accomplished Class AB power.

4R7
2317
3m50
2026C

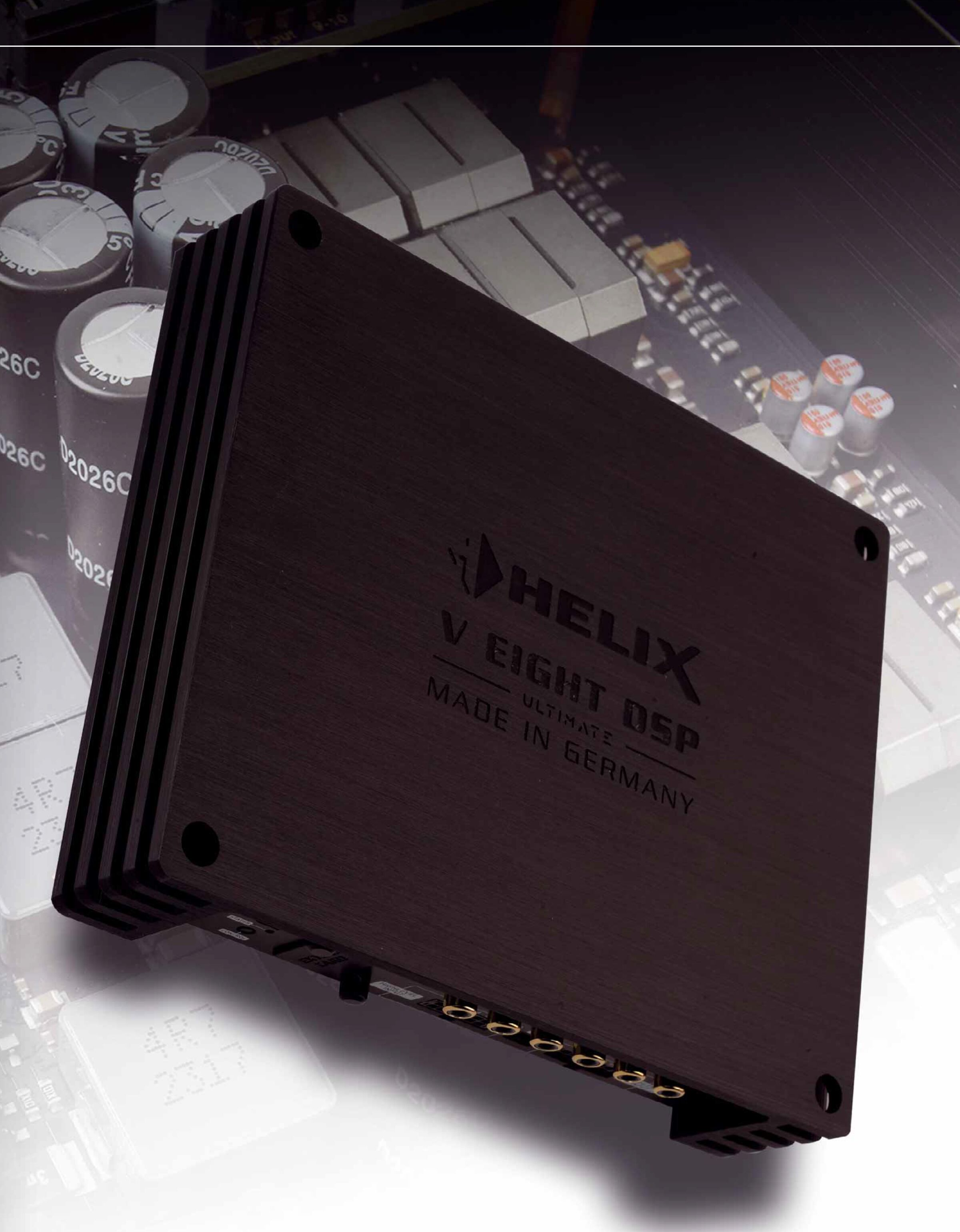
Helix V Eight DSP Ultimate – 8-channel amplifier with 14-channel DSP

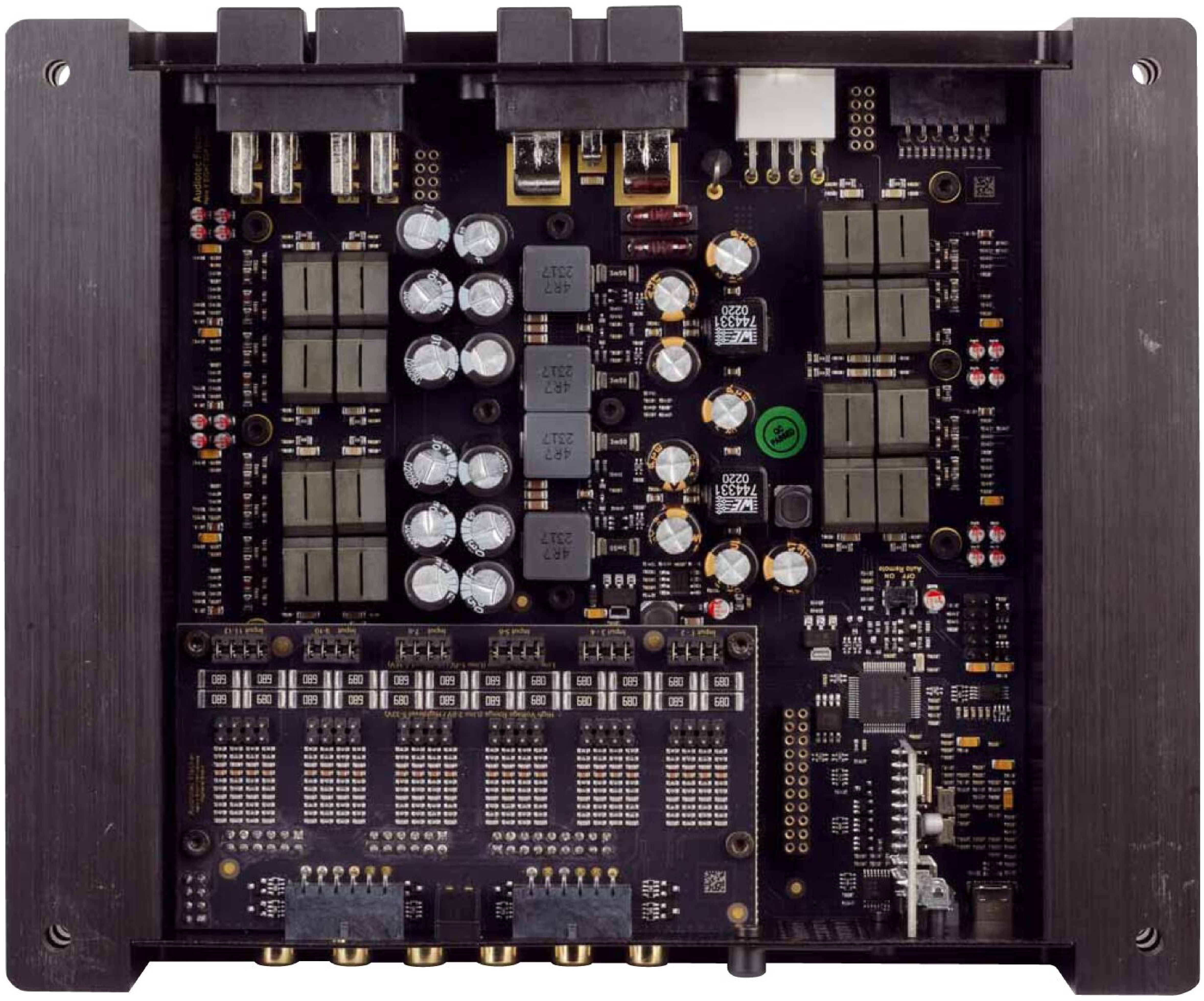
The next generation

With the V Eight DSP Ultimate, Helix introduces the first model of a new amplifier family. The amplifier is under the new Next label, which includes particularly smart and innovative products and is intended to differentiate them from the simpler Amplify line. Under Next, we expect the latest DSP technology, the most extensive integration features, and Made-in-Germany engineering and production, so we are particularly excited about the V Eight DSP Ultimate.

BEST PRODUCT
Absolute Top Class
CAR&HiFi INTERNATIONAL 3/25

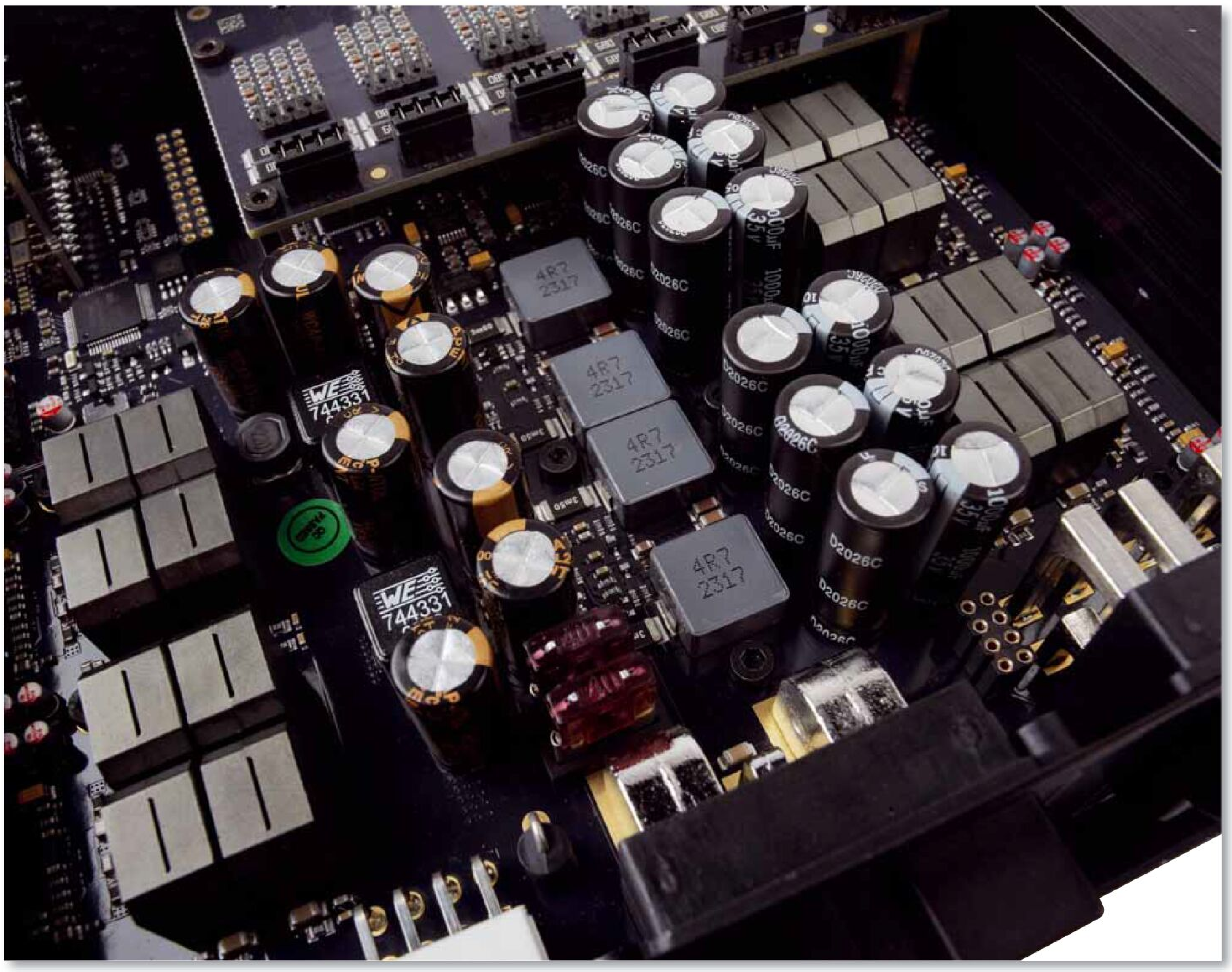
BEST EMC
Undisturbed FM reception
CAR&HiFi INTERNATIONAL 3/25


HELIX
V EIGHT DSP
ULTIMATE
MADE IN GERMANY

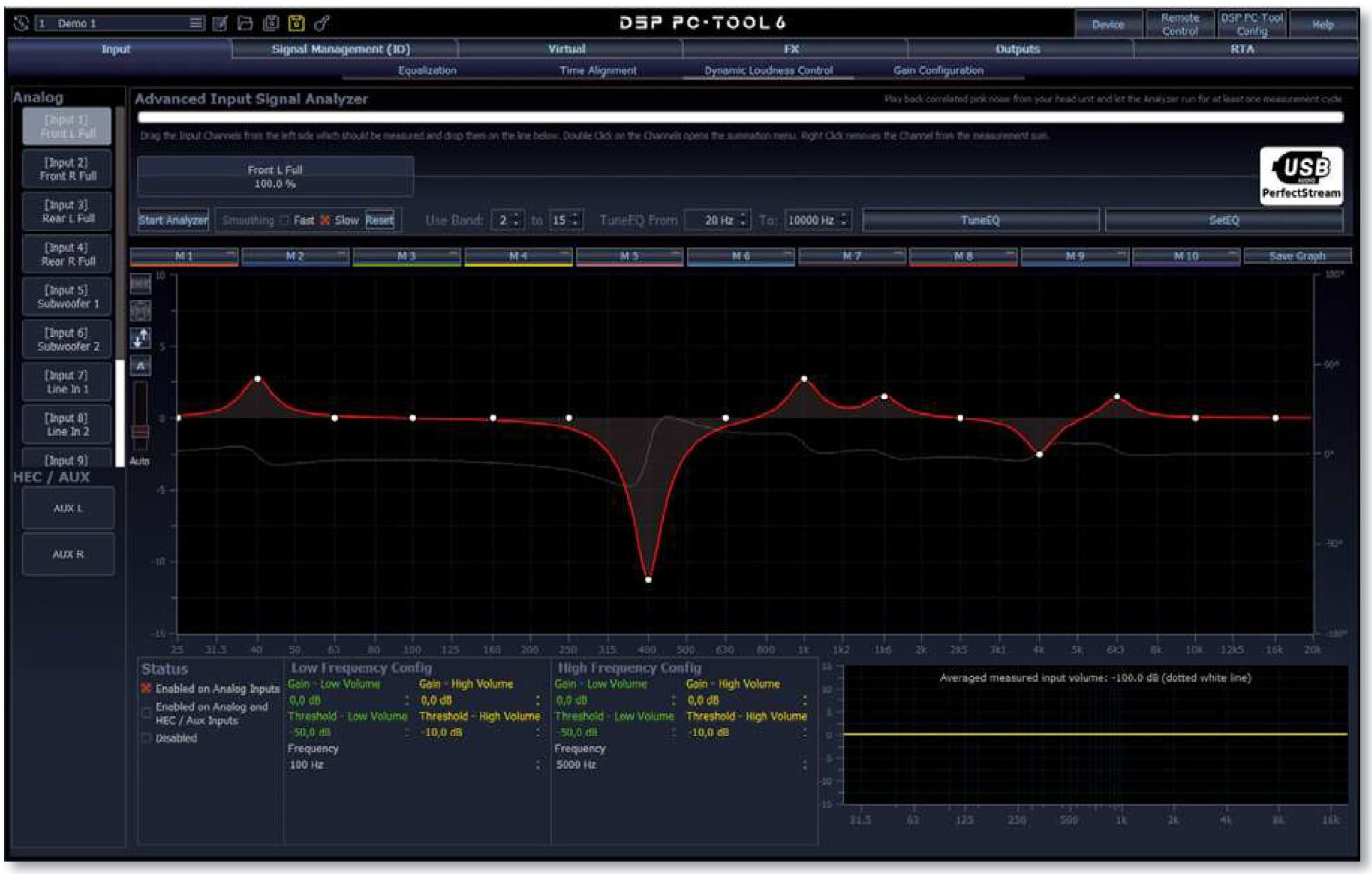


Completely independent: a Helix looks different from any other amplifier

In the field of DSP amplifiers, Helix is one of the pioneers and one of the major players on the market. There is the V series with 8, 12 and even 18 amplifier channels, which can be used to effectively retrofit modern vehicles, in particular. And there is also the top model P Six DSP, currently available in the technically upgraded Ultimate version. Helix now presents the V Eight DSP Ultimate, which comes inconspicuously in the familiar black housing and at first glance only differs from the previous MK2 by the Ultimate lettering. Let me say right away that this impression is misleading. Apart from the appearance and the name, Helix has left no stone unturned with the Ultimate; the new premium amplifier features upgrades everywhere, from the amplification to the power supply, the electronics and even the software. Let us start at the beginning: in addition to the 6 RCA inputs, the V Eight has a full 12 line-level inputs. This helps with integration into newer premium vehicles to retrofit their multi-channel equipment. On the output side, 8 amplifier channels and 6 processed outputs are available, meaning that the V Eight can provide a sound upgrade for a total of 14 channels. On the digital side, there is an optical input and a slot for expansion cards, which are also new (Extension Cards 2.0). As before, the modules are used to retrofit digital sources such as Bluetooth or analogue inputs, but the new 2.0 versions have different mounting panels, making them more practical to use. It is great is that two additional analogue inputs enable full direct 14-channel input-to-output routing to give vehicle-mounted multi-channel systems a boost in terms of sound. Of



The delicate coils of the high-tech power supply are deceptive: there is a kilowatt inside


1 Demo 1
DSP PC-TOOL 6
Device
Remote Control
DSP PC-Tool Config
Help
Input
Signal Management (IO)
Virtual
FX
Outputs
RTA
Equalization
Time Alignment
Dynamic Loudness Control
Gain Configuration
Analog
[Input 1] Front L Full
[Input 2] Front R Full
[Input 3] Rear L Full
[Input 4] Rear R Full
[Input 5] Subwoofer 1
[Input 6] Subwoofer 2
[Input 7] Line In 1
[Input 8] Line In 2
[Input 9]
HEC / AUX
AUX L
AUX R
Advanced Input Signal Analyzer
USB PerfectStream
Start Analyzer
Smoothing
Fast
Slow
Reset
TuneEQ
SetEQ
M 1
M 2
M 3
M 4
M 5
M 6
M 7
M 8
M 9
M 10
Save Graph
Auto
25
31.5
40
50
63
80
100
125
160
200
250
315
400
500
630
800
1k
1k2
1k6
2k
2k5
3k1
4k
5k
6k3
8k
10k
12k5
16k
20k
Status
Low Frequency Config
High Frequency Config

Play back correlated pink noise from your head unit and let the Analyzer run for at least one measurement cycle

Drag the Input Channels from the left side which should be measured and drop them on the line below. Double Click on the Channels opens the summation menu. Right Click removes the Channel from the measurement sum.

Front L Full 100.0 %

Use Band: 2 to 15

TuneEQ From 20 Hz To: 10000 Hz

☒ Enabled on Analog Inputs

☐ Enabled on Analog and HEC / Aux Inputs

☐ Disabled

Low Frequency Config: Gain - Low Volume 0,0 dB; Gain - High Volume 0,0 dB; Threshold - Low Volume -50,0 dB; Threshold - High Volume -10,0 dB; Frequency 100 Hz

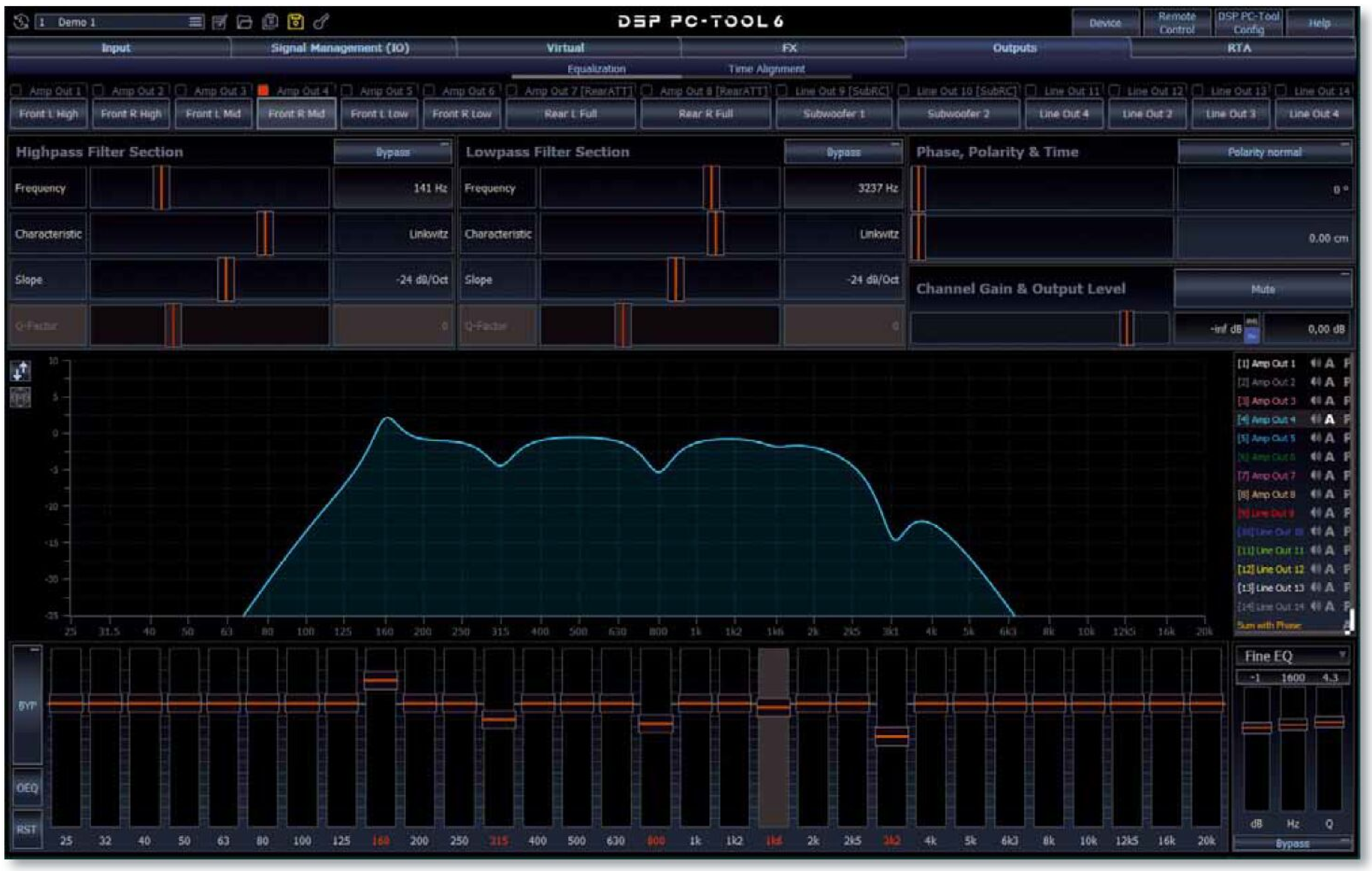
High Frequency Config: Gain - Low Volume 0,0 dB; Gain - High Volume 0,0 dB; Threshold - Low Volume -50,0 dB; Threshold - High Volume -10,0 dB; Frequency 5000 Hz

Averaged measured input volume: -100.0 dB (dotted white line)

The inputs now have 15 EQ bands, time correction and the dynamic loudness of the DLC

course, the (also 14-channel) virtual channel level is also available in the digital signal flow, with which powerful sound tools such as overall equalizing and delay correction are available.

Perhaps the biggest innovation in our V Eight DSP Ultimate is the USB port, which is now a USB C and is called PerfectStream, as the amplifier announced when establishing the PC connection. It is a bidirectional USB audio interface with the corresponding hardware already on the V Eight board. This allows you to do two great things: firstly, wired music streaming in hi-res quality (basically the function of


1 Demo 1
DSP PC-TOOL 6
Device
Remote Control
DSP PC-Tool Config
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Virtual
FX
Outputs
RTA
Equalization
Time Alignment
Amp Out 1
Amp Out 2
Amp Out 3
Amp Out 4
Amp Out 5
Amp Out 6
Amp Out 7 [RearATT]
Amp Out 8 [RearATT]
Line Out 9 [SubRC]
Line Out 10 [SubRC]
Line Out 11
Line Out 12
Line Out 13
Line Out 14
Front L High
Front R High
Front L Mid
Front R Mid
Front L Low
Front R Low
Rear L Full
Rear R Full
Subwoofer 1
Subwoofer 2
Line Out 4
Line Out 2
Line Out 3
Line Out 4
Highpass Filter Section
Lowpass Filter Section
Phase, Polarity & Time
Channel Gain & Output Level
Bypass
Polarity normal
Mute
Fine EQ
BYP
OEQ
RST
Bypass

Highpass Filter Section: Frequency 141 Hz; Characteristic Linkwitz; Slope -24 dB/Oct; Q-Factor 0

Lowpass Filter Section: Frequency 3237 Hz; Characteristic Linkwitz; Slope -24 dB/Oct; Q-Factor 0

Phase, Polarity & Time: 0 °; 0.00 cm

Channel Gain & Output Level: -inf dB; 0,00 dB

The 14 outputs are divided into 8 amplifier channels and 6 processed pre-outs, all with crossovers, EQs, runtime, phase, and level adjustment

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Software

All DSP products of the Brax, Helix and Match brands are controlled via the DSP PC Tool, which at the time of testing was just being released as the PC Tool 6. As always, the software is free and will be backward compatible with all DSP products with the ACO platform (since 2018). The DSP PC Tool 6 features an intuitive user interface and is divided into the 5 main sections: Input, Signal Management, Virtual, FX and Outputs, which can be accessed via tabs. In addition, there is an RTA section for frequency response measurement and various setting options for the amplifier, remote controls and the PC tool itself. The inputs can be freely routed to 14 virtual channels sorted by source, so that a 1:1 looping through of all inputs is also possible. A 15-band EQ, time alignment, and dynamic loudness adjustment are available for all inputs. The latter can emulate a classic loudness correction for low listening volumes, and a reduced treble for high levels, always dynamically, i.e., depending on the volume setting. This function is also available when using a retrofitted remote control.

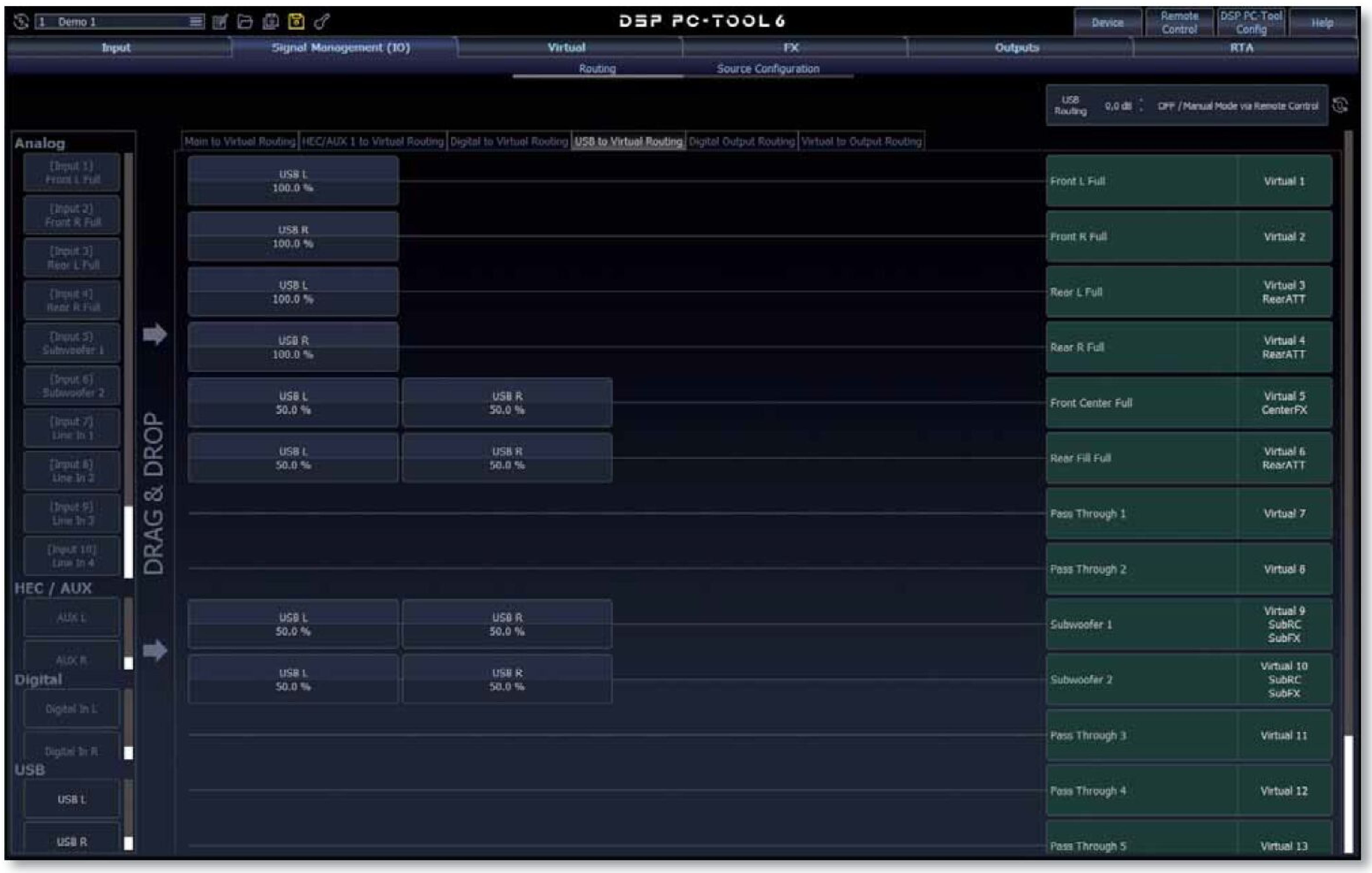
The virtual channel level makes it possible to combine channel groups and process them together. For example, a three-way front system with six output channels for the right and left sides can be managed by the virtual channels front left and right. The running times of the individual speakers and the separation of tweeters, mid-range speakers and woofers are carried out in the output channels, and characteristics of the installation situations are also corrected here. However, the sound-decisive equalizing can be easily performed on the virtual front channels, for the entire front system and across all crossover frequencies. The virtual channel can also be used to “shift” the entire three-way side using time correction or to adjust the level using the gain control. The FX sound effects also affect the virtual front, center, and rear channels, allowing two-way centers to be controlled perfectly. Under the FX (effects) section, algorithms for optimizing the center and subwoofer can be activated. The Real Center is a blessing by its very existence; here, a center channel signal is calculated using specially-programmed audio processing. This means that the Real Center is not an emergency solution like a mono sum or a reversed sum of left and right. For the center, there is the Clarity Expander, which can affect the mid-range reproduction of voices (for example). Bass processing includes the SubXpander, which adds low tones to the music by generating subharmonics to existing frequencies. There is also a dynamic bass boost that increases the bass depending on the playback volume. This is very helpful, for example, in factory systems with woofers and subwoofers that have limited load capacity. There are adjustment controls for all FX functions that can be used to specifically influence the extent and function.

The measuring functions of the PC tool are constantly being expanded. The electrical inputs (AISA) and the acoustic frequency response in the vehicle (RTA) can be measured using a measuring microphone. Thanks to hardware support in the amplifier, AISA (Advanced Input Signal Analyzer) records very quickly and accurately what comes in from the vehicle at the individual inputs. This allows the installer to track down incomplete or distorted signals, and by summing inputs, factory all-pass filters can also be detected that remain inconspicuous in individual measurements. There are constantly growing automatic functions and adjustment aids for both the input measurement and RTA frequency response measurement. If desired, the EQs can be adjusted automatically, allowing tolerance thresholds and the number of EQ bands to be used to be specified. Version 5 also allows the adjustment of individual speakers with their crossovers, creating perfect acoustic filter edges that then also form a clean sound when the speakers play together. The same applies to the input EQ; here, too, the frequency range and number of bands can be freely selected.

There is also ATM (Automatic Time Measurement), which enables fully automatic runtime measurement and adjustment of the entire system. The advantage here is that the measurement signal is played as a sound file like a piece of music via the head unit; this is possible in all vehicles. The measurement is then carried out using our own, in-house programmed measurement signals and a lot of audio processing, whereby the runtime of all loudspeakers in the system is compared with a reference loudspeaker and then calculated.

The new version also includes the advanced import function of setups, which is now also available for the inputs. This makes life easier, especially for professionals, because it allows previously created setups to be transferred in whole or in part to the fresh unit. For example, the existing subwoofer settings of an existing setup can be placed on any two channels with a click. The transfer of high pass, low pass, EQ, gain and name from any channel to any channel is possible for inputs and outputs - practical for power users. Very praiseworthy are the numerous integration features like power save mode for CAN vehicles or bypass circuits for diagnostic programs of some factory radios and a freely configurable source management with automatic switching of sources and vehicle sounds. The in-house ADEP.3 system is capable of bypassing the speaker diagnostics of some vehicles, thus bypassing error codes or even disabling channels

the HEC HD-Audio USB module), for all platforms: PC, Mac, Android and mobile iOS. On the other hand, PerfectStream supports the transmission of measurement signals for the latest, fast incarnation of AISA (advanced input signal analyzer) by enabling both the measurement of vehicle-side signals at the V Eight inputs and the input of audio measurement signals. An external sound card is no longer required, but the in-house measurement interface AMI is required for measurements with AISA and RTA (frequency response measurement with microphone). The V Eight DSP Ultimate is the first amplifier to combine the latest ACO platform for controlling digital functions, USB audio and the new DSP PC Tool 6 software, which


1 Demo 1
DSP PC-TOOL 6
Device
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Virtual
FX
Outputs
RTA
Routing
Source Configuration
USB Routing
0,0 dB
OFF / Manual Mode via Remote Control
Analog
Main to Virtual Routing
HEC/AUX 1 to Virtual Routing
Digital to Virtual Routing
USB to Virtual Routing
Digital Output Routing
Virtual to Output Routing
[Input 1] Front L Full
[Input 2] Front R Full
[Input 3] Rear L Full
[Input 4] Rear R Full
[Input 5] Subwoofer 1
[Input 6] Subwoofer 2
[Input 7] Line In 1
[Input 8] Line In 2
[Input 9] Line In 3
[Input 10] Line In 4
HEC / AUX
AUX L
AUX R
Digital
Digital In L
Digital In R
USB
USB L
USB R
DRAG & DROP
USB L 100.0 %
USB R 100.0 %
USB L 100.0 %
USB R 100.0 %
USB L 50.0 %
USB R 50.0 %
USB L 50.0 %
USB R 50.0 %
USB L 50.0 %
USB R 50.0 %
USB L 50.0 %
USB R 50.0 %
Front L Full
Virtual 1
Front R Full
Virtual 2
Rear L Full
Virtual 3 RearATT
Rear R Full
Virtual 4 RearATT
Front Center Full
Virtual 5 CenterFX
Rear Fill Full
Virtual 6 RearATT
Pass Through 1
Virtual 7
Pass Through 2
Virtual 8
Subwoofer 1
Virtual 9 SubRC SubFX
Subwoofer 2
Virtual 10 SubRC SubFX
Pass Through 3
Virtual 11
Pass Through 4
Virtual 12
Pass Through 5
Virtual 13

The routing is carried out in two steps: from the inputs to the virtual channel level and from virtual to the outputs

is currently in the starting blocks. We will find this platform in many new DSP products in the future - and the ingenious thing about it: with the exception of the hardware-dependent USB audio functionality, all devices with the ACO platform, which means all devices from the Helix DSP Mini in 2018 onwards, will have the new functions of the DSP PC Tool 6! But that is another story, which we will soon tell in detail in a separate article.

The innovations of the V Eight continue apace, as can be seen after opening the housing. The power supply

Specifications

Inputs
- 6-channel RCA
- 12-channel High-level
- 1 x digital S/PDIF (optical)
- 1 x USB audio
- Sensitivity Low: 4/8 V, High: 16/32 V (via jumper)

Outputs
- 6-channel RCA (3 V)
- 2 x Remote-out

DSP-Channels
- 14 Outputs + 8 virtual channels

DSP-Software (V 6.01)

Equalizer

Inputs:
- param., 15 bands per channel
- EQ, shelf, allpass filters 1st and 2nd order

Virtual channels:
- param., 30 bands per channel
- EQ, shelf, allpass filters 1st and 2nd order

Outputs:
- param., 30 bands per channel, +6 – -15 dB
- 20 – 20k Hz, 1-Hz increments, Q 0,5 – 15
- Shelf 25 – 10k Hz, Q 0,1 – 2
- Allpass filters 1st or 2nd order

Crossovers

Outputs:
- 20 – 20k Hz, 1-Hz increments
- Bessel, Butterworth, Chebychev, Linkwitz, User, 6 – 42 dB/Okt.

Time and level
- Samplerate 48 kHz, 7 mm increments (0,02 ms)

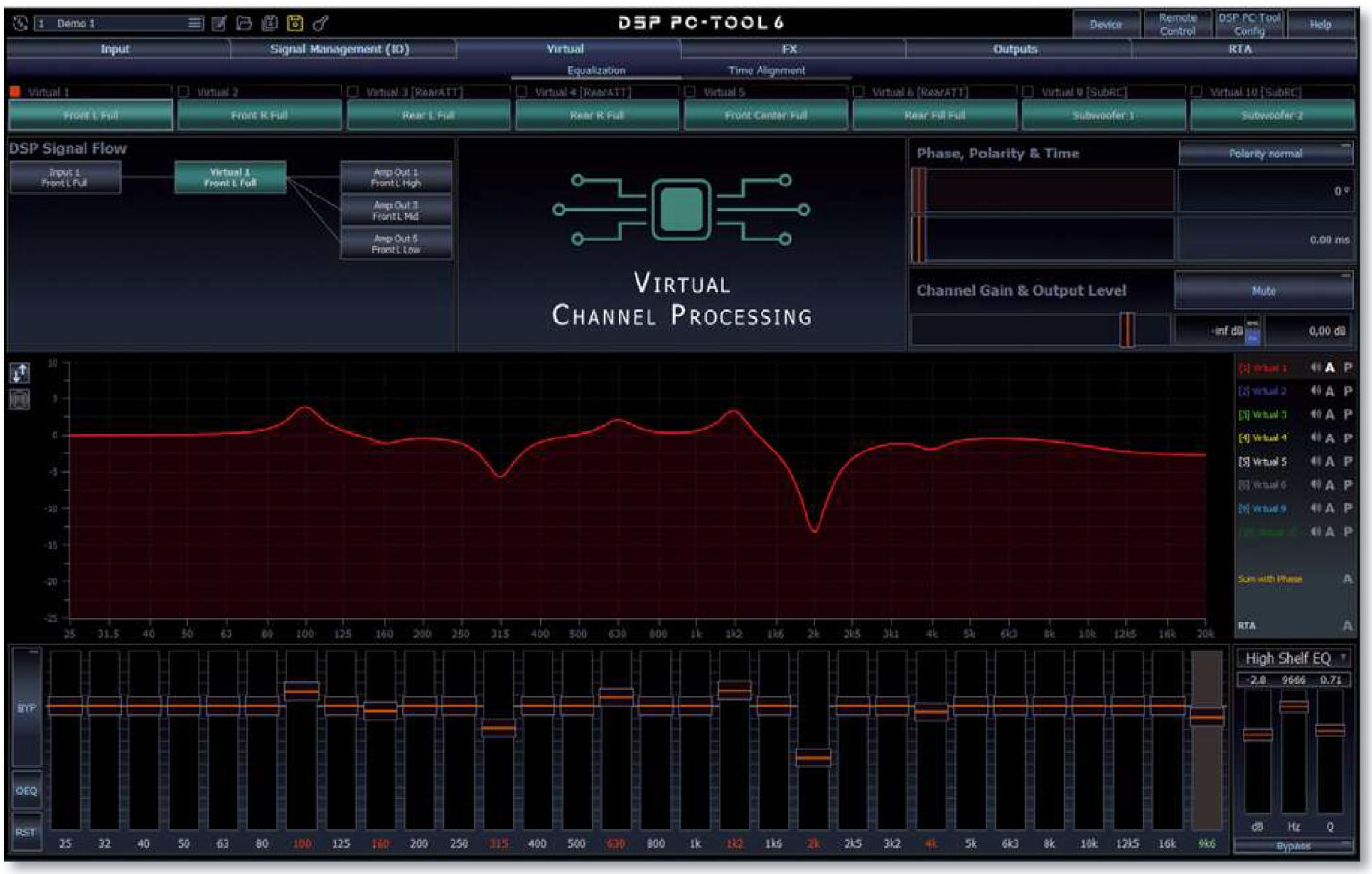
Inputs:
- 0 – 176 cm (5,2 ms), 256 samples

Virtual channels:
- 0 – 354 cm (10,4 ms), 512 samples

Outputs:
- 0 – 708 cm (20,82ms), 1024 samples
- Phase 0, 180° (fullrange), 0 – 360° (22,5° increments)
- Adjustable level increments 0,1– 1 dB

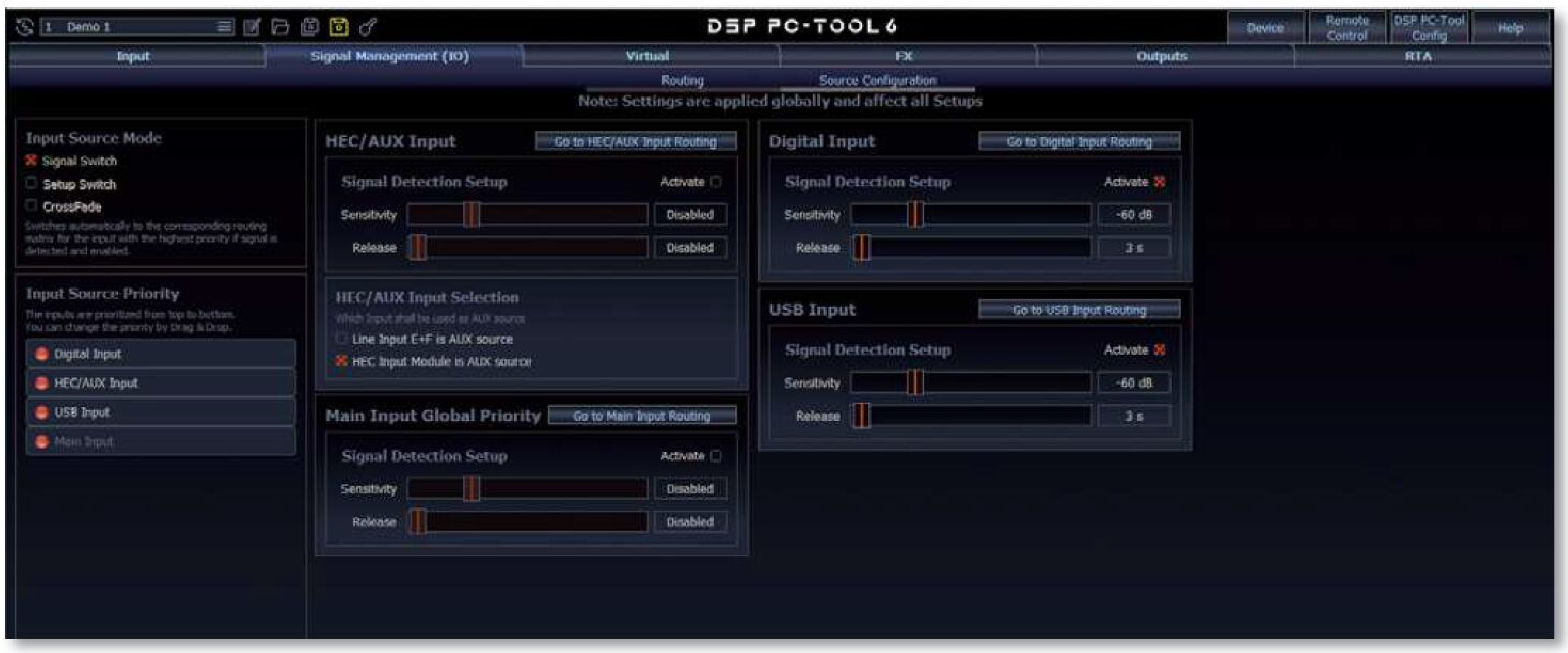
Features
- 10 Setups with fast switchover
- User-defined routing of in- and output ports
- SCP control connector for programmable remote controls and accessories
- Start-stop capability up to 6V
- Signal-dependent switching to digital or Aux inputs
- Automatic putting through of all vehicle tones
- Power-Save-Mode
- ADEP.3 error protection circuit for factory radios with speaker recognition
- RTA real-time frequency curve measurement (with optional microphone), automatical adjustment including filter slopes
- FX menu with dynamic bass, center and front processing
- aISA for measuring, summing and correcting inputs, via USB without additional hardware, bidirectional, sigal playback and analysis
- Time Machine for taking back and restoring adjustments
- Device Monitor (temperature and voltage control)
- ATM automatic time alignment with custom signal
- Import of setups and data from other devices
- VCP (optionally activated), virtual channels, routable, with EQ, time alignment and FX processing

Optional accessories
- Wired remote control (programmable)
- Display remote control Director with memory, USB, etc.
- Smart remote control Conductor
- WIFI Control for wireless programming
- AMI measurement interface
- EC 2.0 Extension Cards (Bluetooth, additional analog or digital inputs)

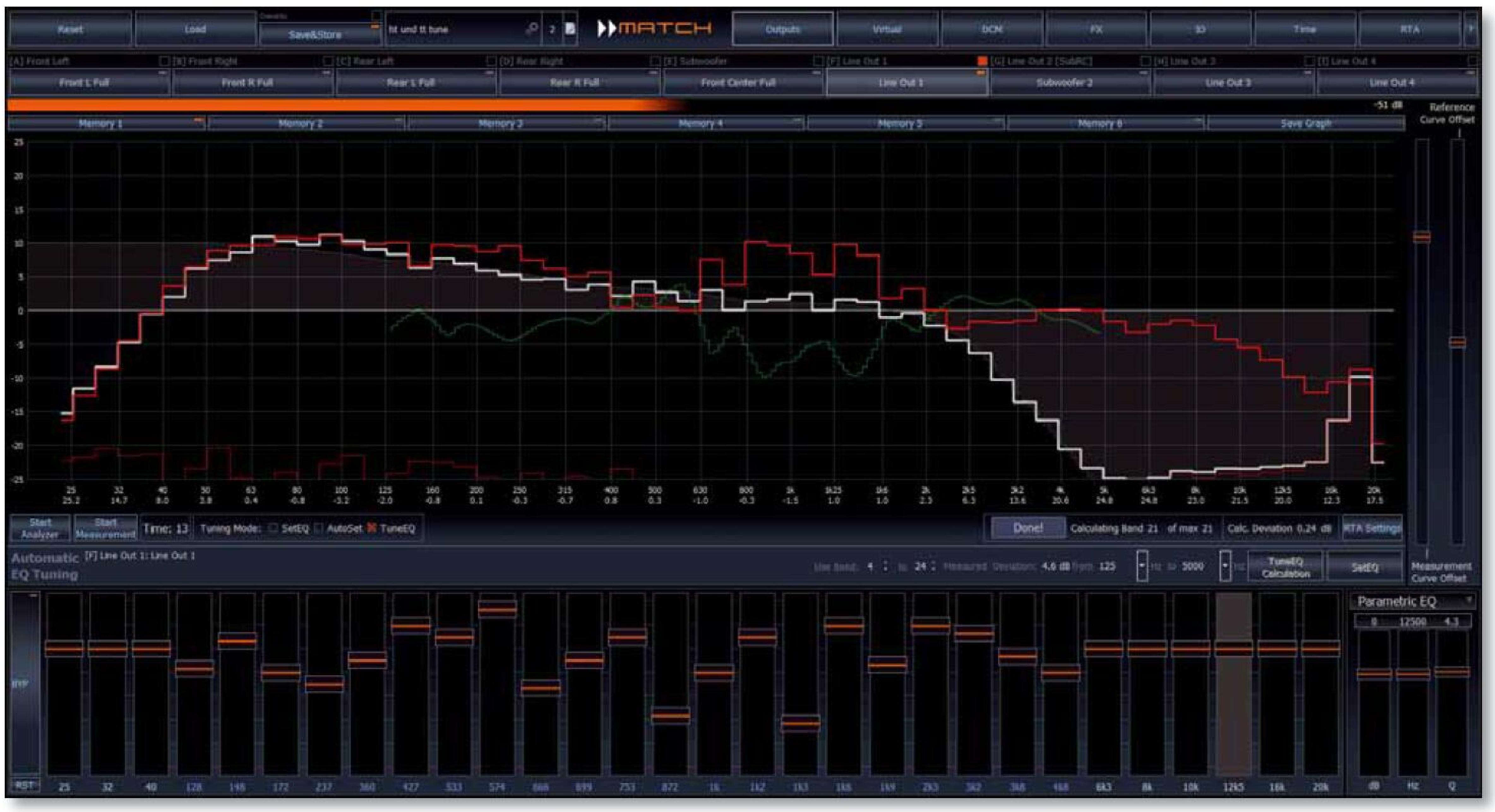

DSP PC-TOOL 6
Device
Remote Control
DSP PC-Tool Config
Help
Input
Signal Management (IO)
Virtual
FX
Outputs
RTA
Equalization
Time Alignment
Front L Full
Front R Full
Rear L Full
Rear R Full
Front Center Full
Rear Fill Full
Subwoofer 1
Subwoofer 2
DSP Signal Flow
Virtual Channel Processing
Phase, Polarity & Time
Polarity normal
Channel Gain & Output Level
Mute
High Shelf EQ
BYP
OEQ
RST
Bypass

8 virtual channels such as the front system, center, rear system, and subwoofer have EQs, time correction, and FX functions such as RealCenter and SubXpander

alone is incredible; we find four tiny coils of a multiphase synchronous converter instead of a traditional transformer power supply. Helix has already tested the arrangement in the center of the board on the V Eighteen DSP; the whole thing is intended to achieve optimal efficiency, which is becoming increasingly important in the age of electric vehicles. The V Eight operates according to the Class HD principle, which means (in contrast to the three-stage control of Class GD) a virtually stepless control of the internal working voltage, so that it is dosed in real time exactly as needed, thus achieving maximum efficiency. The control is carried out in a forward-looking manner thanks to DSP, which analyses the music signal to be amplified and therefore "knows" what dynamic jumps will follow, for example. For final amplification, the V Eight DSP Ultimate also relies on integrated amplifier chips from Texas Instruments. Audiotec Fischer maintains a development collaboration with TI, so that a new generation of ICs is installed here, which offer an enormous increase in performance even compared to the V Eight DSP MK2. The chips are basically designed with two channels but can also be connected in different ways. Our V Eight DSP Ultimate has four small channels (1-4) that are distributed across two ICs and are 4 ohm stable. The large channels 5-8 each have their own parallel IC with


DSP PC-TOOL 6
Input
Signal Management (IO)
Virtual
FX
Outputs
RTA
Routing
Source Configuration
Note: Settings are applied globally and affect all Setups
Input Source Mode
Signal Switch
Setup Switch
CrossFade
Input Source Priority
Digital Input
HEC/AUX Input
USB Input
Main Input
HEC/AUX Input
Go to HEC/AUX Input Routing
Signal Detection Setup
Activate
Sensitivity
Release
Disabled
HEC/AUX Input Selection
Line Input E+F is AUX source
HEC Input Module is AUX source
Main Input Global Priority
Go to Main Input Routing
Digital Input
Go to Digital Input Routing
-60 dB
3 s
USB Input
Go to USB Input Routing

Sound setups can be switched when changing sources or after a control signal; all sources can be prioritized via drag & drop


Reset
Load
Save&Store
MATCH
Outputs
Virtual
DCM
FX
IO
Time
RTA
Front L Full
Front R Full
Rear L Full
Rear R Full
Front Center Full
Line Out 1
Subwoofer 2
Line Out 3
Line Out 4
Memory 1
Memory 2
Memory 3
Memory 4
Memory 5
Memory 6
Save Graph
Reference Curve Offset
Start Analyzer
Start Measurement
TuneEQ
Done!
Automatic EQ Tuning
Parametric EQ
BYP
RST

RTA measurement of a woofer/mid-range driver: original curve (red) and result with 24 dB separation (white). The correction via TuneEQ is shown in green, and the EQ bands 4 – 24 are set below. We measured with an accuracy of 1/6 octave and standard smoothing; it can be finer if desired

X SERIES
DSP-AMPLIFIER

X SERIES
BY AUDIO SYSTEM
X-100.5 MDSP-BT

KLANGTIPP
Spitzenklasse
CAR&HiFi 4/2025

Audio System X-100.5 MDSP-BT
Spitzenklasse 1,3
CAR&HiFi 4/25
Preis/Leistung: sehr gut
„Sehr gut gemachter DSP, viel Leistung in äußerst kompakter Verpackung.“

X-100.5 MDSP-BT + X-100.5 MDSP-BT 24V

- 5-channel-amplifier with 9x DSP-channel and BT/App
- 4x 100 (140) WRMS @ 4 (2) ohm + 1x 30 WRMS @ 4 ohm
- 6x RCA input or high level
- **Price: 500 Euro**

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04910 Elsterwerda + Pötzsch GmbH & Co. KG
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10787 Berlin + MASORI
32278 Kirchlengern + CARHIFI-STORE BÜNDE
35108 Allendorf / Eder + Audiomativ GmbH Co.KG
49809 Lingen + Car-HiFi-Shop Lingen
53227 Bonn + Audiowave
54595 Prüm + Special Car Hifi Systems
55252 Mainz-Kastel + Hifi-Zone
59439 Holzwickede + CHS Solutions GmbH
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74889 Sinsheim + Vibes Audio Forum
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97469 Gochsheim + ACR Schweinfurt
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X SERIES
BY AUDIO SYSTEM
X-100.9 MDSP-BT

KLANGTIPP
Absolute Spitzenklasse
CAR&HiFi 3/2025

Audio System X-100.9 MDSP-BT
Absolute Spitzenklasse 1,1
CAR&HiFi 3/25
Preis/Leistung: hervorragend
„9 Kanäle, kompakt und gut.“

X-100.9 MDSP-BT + X-100.9 MDSP-BT 24V

- 9-channel-amplifier with 13x DSP-channel and BT/App
- 8x 100 (140) WRMS @ 4 (2) ohm + 1x 30 WRMS @ 4 ohm
- 6x RCA input or high level
- **Price: 650 Euro**

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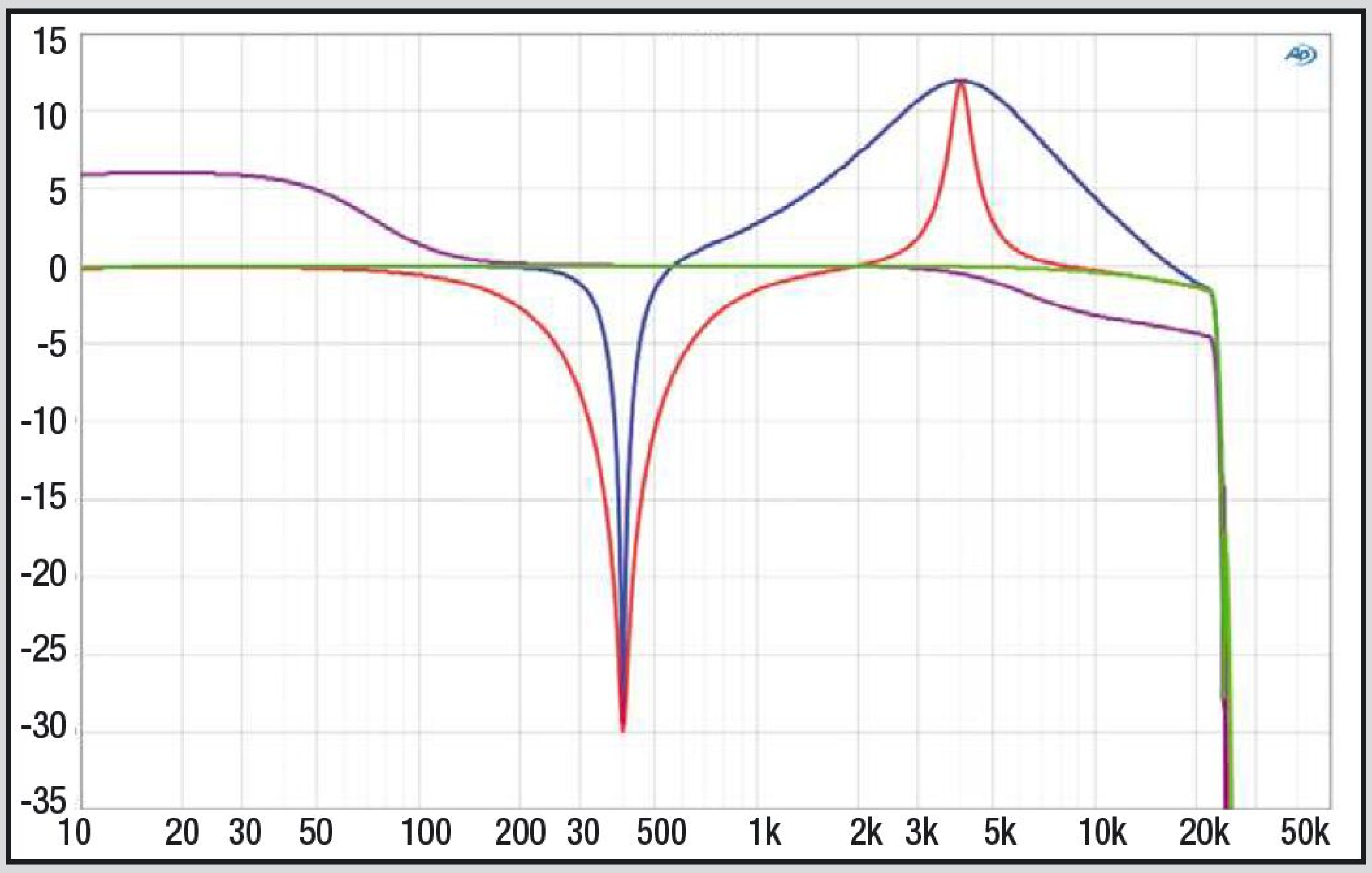
plenty of power at just 2 ohms. The chips are hidden under the motherboard so that they lie directly against the housing, tightly screwed in for the best possible transfer of heat. Also on the board is the Atmel 32-bit microcontroller, the heart of the ACO platform; as with the DSP, there are hardly any hardware changes here. Further development takes place in secret and the development department has significantly optimized processor usage, making the many innovations in the software possible. It is similar with the DSP, which still comes from Analogue Devices and turns out to be an ADAU1452. It is flanked by two TI PCM3168 codecs, each with 6 inputs and 8 DACs, so that we get 12 high-level inputs and could theoretically process 16 outputs.

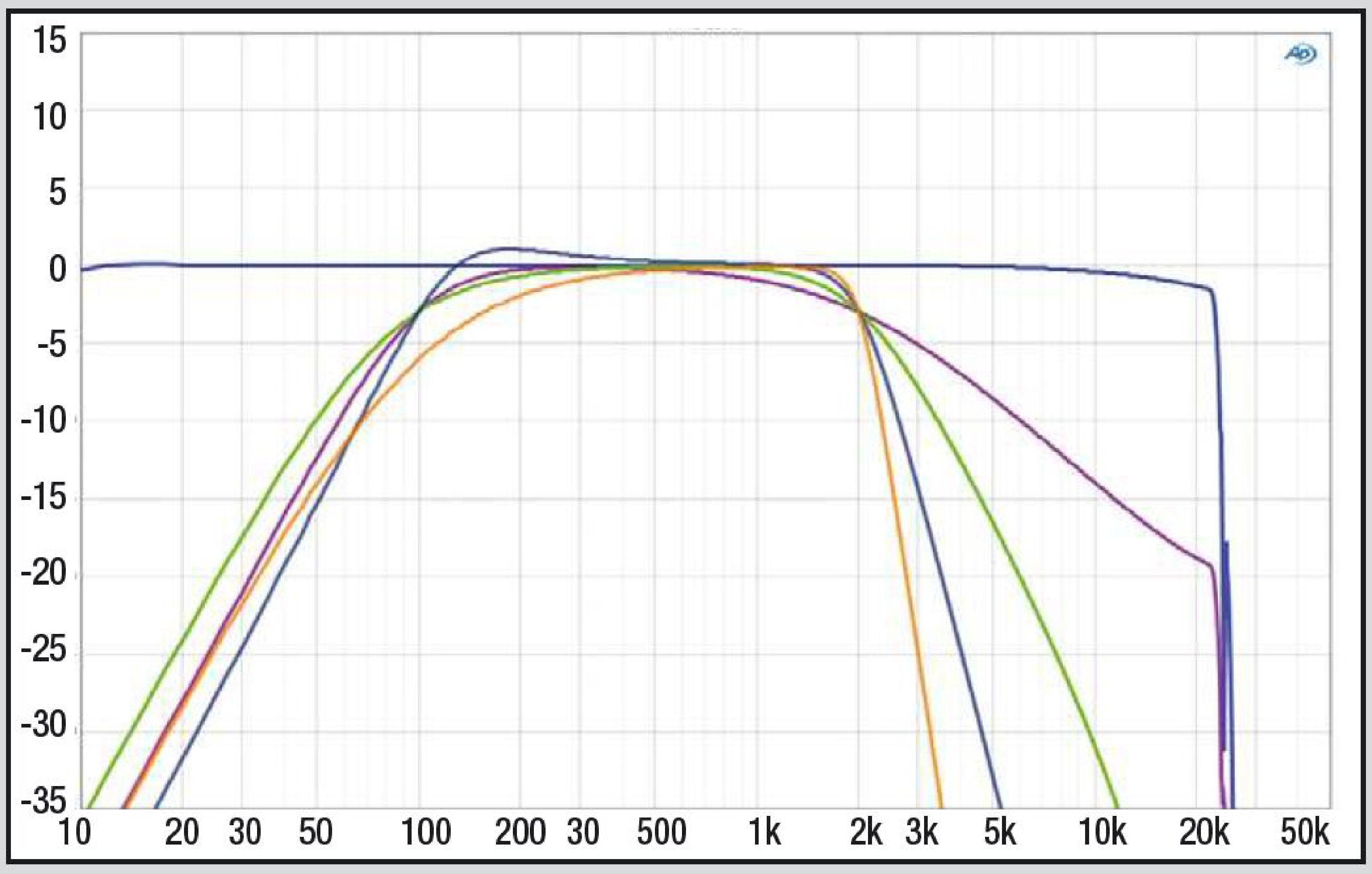
Measurements and sound

In the test lab, the V Eight DSP Ultimate leaves an excellent impression. The noise floor is nice and low, and at 5 watts of power, we measured two zeros after the decimal point with only 0.007% THD+N. The Helix also performs flawlessly under surge protection and under start-stop conditions. The DSP works flawlessly, and we are pleased with the highly variable filters, which offer precise, steep separations using Chebychev filters or even user-defined filter qualities. The EQs include everything

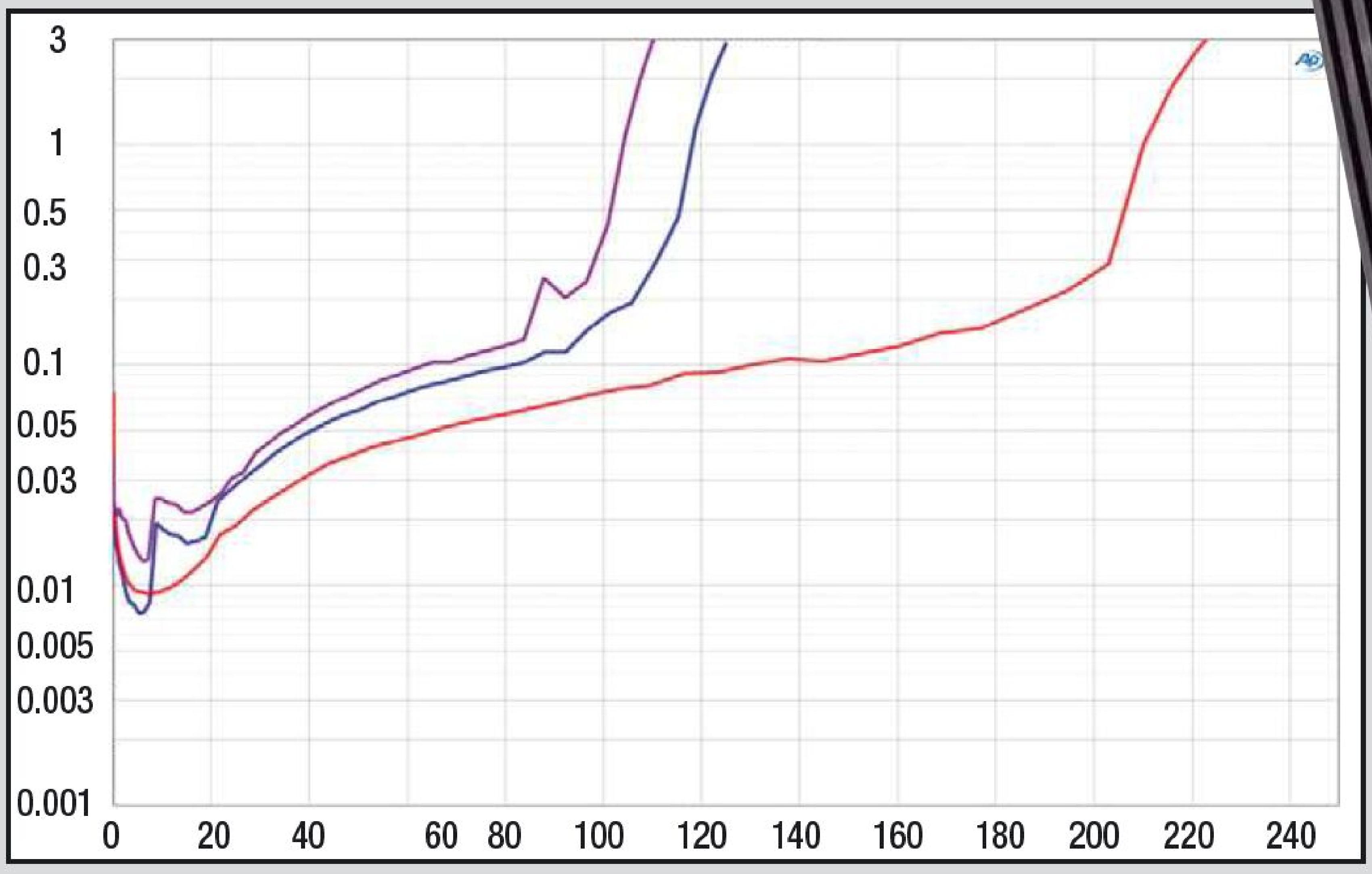
CAR&HIFI Laboratory



The equalizers also work as shelf or all-pass, and they have practical adjustment ranges. At about 22 kHz it stops due to the sampling rate of 48 kHz

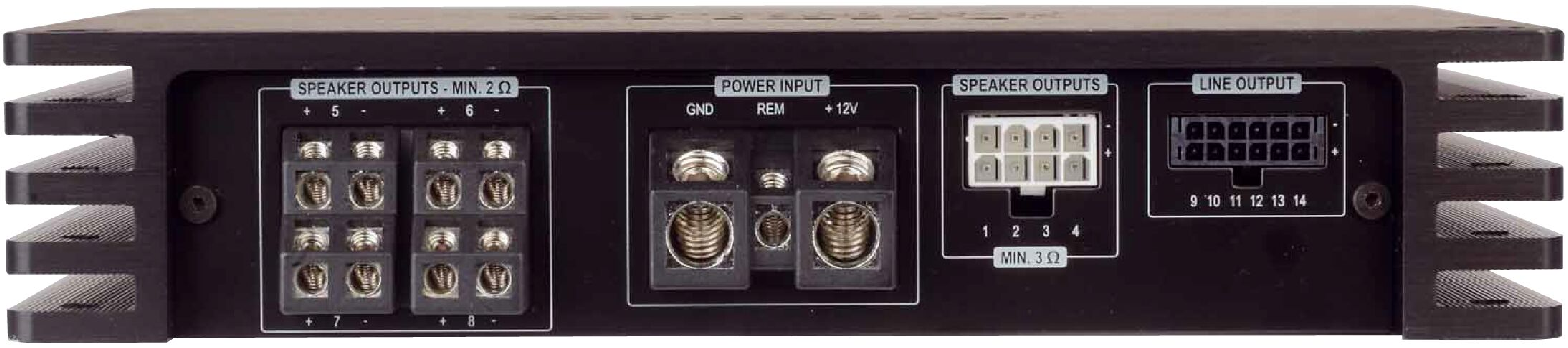


The crossovers work exemplary, there is everything from flat bass filters to steep Chebychev to choose from, even a user-defined filter quality



At 4 ohms, all 8 channels perform approximately equally. Channels 5-8 are 2 Ohm stable and deliver a solid 210 Watts

HELIX
V EIGHT DSP
ULTIMATE
MADE IN GERMANY



On the output side there are 4 large channels with screw terminals and a Molex for the 4 small channels. On the input side, the V Eight impresses with 12 high-level inputs

from EQ, shelf, and all-pass. There are EQs and time alignments for inputs, virtual channels and outputs, and there are a lot of them, so that, as is often the case with Helix, you wonder how all of this was squeezed out of the DSP. But the best thing is the new TI chips, which achieve an enormous increase in performance. We measured 104 watts at 4 ohms on the small channels and 118 watts on the large channels. At 2 ohms, channels 5-8 really crank up the power, delivering 210 watts of power. With the system power at 4 x 4 ohms and 4 x 2 ohms, we measured 1032 watts, which means the V Eight DSP Ultimate easily exceeds the kilowatt mark. In terms of sound, the journey is towards dynamics, both coarse dynamics with alarm at high levels and fine dynamics where the details come out of nowhere. The Helix handles both female and male voices carefully and musically, and instruments sound natural and neutral. The V Eight is especially fun with percussion, with its wonderful overtone content, and last but not least, we have a bass that is unparalleled among chip amplifiers.

Conclusion

With the V Eight DSP Ultimate, Helix presents a DSP amplifier that is packed with innovation from front to back. Never before has there been a sound upgrade tool that could do more: maximum fun factor with just one upgrade device. The combination of the new ACO/USB platform and the DSP PC Tool 6 makes the Ultimate an unrestricted integration artist.

Elmar Michels

Specifications

Channels	8
Channel power 4 ohms W	4 x 104 + 4 x 118
Channel power 2 ohms W	4 x 210
Channel power 1 ohms W	–
Bridged power W	–
System power W	1032
Sensitivity max. mV	var.
Sensitivity min. V	var.
THD+N (<22 kHz) 5W	0,01
THD+N (<22 kHz) half power	0,08
Signal-to-noise ratio dB(A)	91
Damping factor 20 Hz	118
Damping factor 80 Hz	118
Damping factor 400 Hz	117
Damping factor 1 kHz	107
Damping factor 8 kHz	15
Damping factor 16 kHz	4

Features

Low pass	20 – 20k Hz
High pass	20 – 20k Hz
Band pass	20 – 20k Hz
Bass boost	-12 – 12 dB/20 – 20k Hz
Subsonic filter	via HP
Phase shift	0, 180°/LZK via DSP
High-level inputs	•, 12 CH
Auto turn-on	•, DC or signal
RCA output	•, 6CH, processed
Start/stop capable	• (6 V)
Dimensions (L x W x H mm)	220 x 180 x 44
Others	14-channel DSP

Helix V Eight DSP Ultimate

Price	**1.350 Euro**
Contact	Audiotec Fischer, Germany
Internet	www.audiotec-fischer.com

Rating

Sound	40 %	★★★★★
Bass	8 %	★★★★★
Neutrality	8 %	★★★★★
Transparency	8 %	★★★★★
Spatial imaging	8 %	★★★★★
Dynamics	8 %	★★★★★
Lab	35 %	★★★★★
Power	20 %	★★★★★
Damping factor	5 %	★☆☆☆☆
Signal-to-noise ratio	5 %	★★★★★
Noise	5 %	★★★★☆
Practice	25 %	★★★★★
Features	15 %	★★★★★
Build quality electronics	5 %	★★★★★
Build quality mechanics	5 %	★★★★★

Absolute Top Class
★★★★★

CAR&HiFi INTERNATIONAL Germany 3/25

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„The beginning of a new generation of amplifiers, packed with innovation.“

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- **Upper Class** – Products for quality-conscious connoisseurs who value good value for money
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The rating

Devices are tested and rated according to strict criteria and can reach up to five "stars". Ratings are only comparable within a class and device type. To score four stars in the top class, the device must meet more demanding requirements than for a 4-star rating in the upper class. The model names, prices (RRP), and equipment specifications for the devices always refer to the German market at testing. For some devices, prices and features may differ in the individual countries.

The star rating provides comprehensive and concise orientation when searching for devices for your in-car entertainment. However, depending on your situation and application, the device with the best star rating is not automatically the best fit for you. For example, an amplifier may score very well overall but may be difficult to connect to your car radio. So additional effort has to be considerated for integration or a different model might be the better choice. Therefore, you should additionally consult the detailed information provided in the text of the test reports.

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